Appendix A

AN ANALYTICAL TREATMENT OF DELAYS & DELAY COSTS

In airline operations poor visibility results in delays, diversions, and cancellations. Each of these disruptions of normal operation carries with it an economic penalty. The purpose of this Appendix is to present the method by which visibility data for an airport can be used to generate information regarding delays, diversions and the cost associated with them.

The derivation begins with the development of equations for the delays and diversions due solely to bad weather. These equations are then extended to include the compounding of delay due to traffic accumulation during the bad weather. The entire derivation is structured to utilize visibility data in the form which is presented in Table VI of each of the Climatological Summaries (Ref. A-1). These tables list the number of occurrences during a ten-year period of visibilities at or below the listed levels. The tables further subdivide the data into time intervals of bad weather durations.

The derivation of the equations is shown below.

T_i	Time values between which visibility data is provided.
X_i	Visibility data; the number of occurrences in ten years of visibility below a specified level with a duration between T_{i-1} and T_i. These values come from Table VI in the Summaries.
W	The actual duration of a bad weather sample.
W_i	The average duration of bad weather between T_{i-1} and T_i.
L	The maximum aircraft loiter (or delay) capability.
M	The number of minutes in ten years.
i	Index of the tabular data ($0 \leq i \leq 11$)

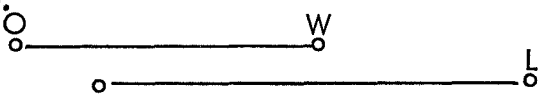
The first part of this derivation will be concerned only with values of L that are equal to some value of T_i. That is, 'n' can be found where $L = T_n$. T_i has these values;

T_i = 0, 15, 30, 45, 60, 90, 120, 180, 240, 360, 480, 600.

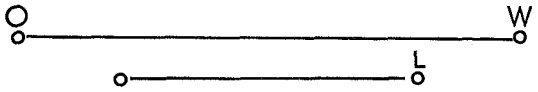
The equations will then be generalized for any value of L, where $0 < L < 600$.

The delays an aircraft may encounter can be classified in three categories. The aircraft is also assumed to divert if the delay exceeds its loiter capability (L).

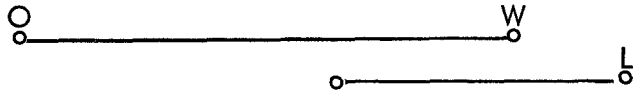
D_s - The average delay associated with relatively short periods of low visibility ($L > W$).



D_d - The average delay experienced before a diversion occurs (the aircraft has waited for L minutes but the weather did not clear) ($W > L$).



D_e - The average delay associated with periods of weather longer than the loiter time, but where the aircraft arrived late enough such that the weather cleared in time for landing ($W > L$).



In order to find the expressions for these delays, the following probabilities must be found.

$P(E)$	The probability of encountering the weather condition.
$P(D \mid E)$	The probability of diversion given that weather of length $W > L$ is encountered.
$P(D)$	The probability of diversion.
$P(C \mid E)$	The probability of being able to land given that weather of length $W > L$ is encountered.
$P(C)$	The probability of being able to land after weather of length $W > L$.

The derivation follows: Given values of T_i and X_i,

$W_i = \dfrac{T_{i-1} + T_i}{2}$ the average duration of weather in the interval between T_{i-1} and T_i.

To find D_s:

$L = T_n$, since $W < L$ the following holds for $i \leq n$.

$P_i(E) = \dfrac{W_i X_i}{M}$, the probability of encounter for the interval associated with i.

$D_a = \dfrac{W_i}{2}$, the average time spent in delays in that interval, given that it is encountered in a uniformly random manner.

$D_i = P_i(E) D_a$, the average delay associated with that interval.

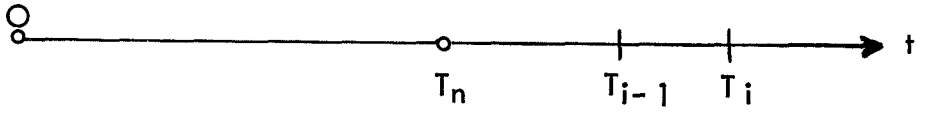
$$D_s = \sum_{i=1}^{n} P_i(E) D_a = \sum_{i=1}^{n} \frac{W_i^2 X_i}{2M}$$

To find D_d:

The following holds for $i > n$, since $W > L$

$P_i(D \mid E) = \dfrac{W_i - L}{W_i}$, the probability of diversion associated with that interval, given that it is encountered.

This expression for $P_i(D \mid E)$ is an approximation since it uses W_i, the average values for duration. The true value of $P_i(D \mid E)$ is derived below and shown to approximate the above.



The probability of diversion (given encounter) for a given weather duration 't' ($t = W > Tn = L$) is

$$P_t = \frac{t - T_n}{t}$$

The average probability over the interval is the integral of P_t divided by the length of the interval.

$$P_i(D \mid E) = \frac{1}{T_i - T_{i-1}} \int_{T_{i-1}}^{T_i} P_t \, dt = \frac{1}{T_i - T_{i-1}} \int_{T_{i-1}}^{T_i} \frac{t - T_n}{t} \, dt$$

$$P_i(D \mid E) = \frac{(T_i - T_{i-1}) - T_n \ln (T_i/T_{i-1})}{(T_i - T_{i-1})}$$

The first approximation of $\ln(x)$ is

$$\ln(x) \cong \frac{2(x-1)}{x+1}$$

so $\ln (T_i/T_{i-1}) \cong \dfrac{2(T_i - T_{i-1})}{T_i + T_{i-1}}$

$$\text{so } P_i(D|E) = 1 - \frac{2T_n}{T_i + T_{i-1}}$$

$$P_i(D|E) = \frac{\left(\frac{T_i + T_{i-1}}{2}\right) - T_n}{\left(\frac{T_i + T_{i-1}}{2}\right)}$$

$$\text{but } W_i = \frac{T_i + T_{i-1}}{2}, \quad L = T_n$$

$$\text{so } P_i(D|E) = \frac{W_i - L}{W_i}$$

The approximation is judged good enough since the error at the largest value of T_i/T_{i-1} ($= 30/15 = 2$) is four percent.

Continuing, to find D_d:

$$P_i(D) = P_i(D|E)\ P_i(E), \text{ for } i > n$$

$$= \frac{W_i - L}{W_i} \cdot \frac{W_i X_i}{M} = \frac{(W_i - L)X_i}{M}$$

$$P(D) = \sum_{n+1}^{11} \frac{(W_i - L)X_i}{M} \quad \text{the probability of diversion.}$$

It is assumed that the aircraft has been delaying L minutes before diverting, so the average delay experienced before diversion is

$$D_d = L\ P(D) = \frac{L}{M} \sum_{n+1}^{11} (W_i - L)\ X_i$$

To find D_e:

The following holds for $i > n$, since $W > L$.

$P_i(C|E) = \frac{L}{W_i}$, the probability of landing associated with that interval, given that weather lasting longer than L is encountered.

Again, this approximation, which uses the average weather duration, is supported by the reasoning used before.

$$P_i(C) = P_i(C|E)\ P_i(E)$$

$$= \frac{L}{W_i}\ \frac{W_i X_i}{M} = \frac{L}{M}\ X_i$$

Assuming a uniform distribution of arrival in the period W-L to W, the average delay is $\frac{L}{2}$ minutes.

$$\text{so} \quad D_i = \frac{L^2}{2M} X_i$$

$$\text{and} \quad D_e = \frac{L^2}{2M} \sum_{n+1}^{11} X_i$$

To find the total average delay per landing, D_T, the three components would be added.

$$D_T = \sum_{i=1}^{n} \frac{W_i^2 X_i}{2M} + \frac{L}{M} \sum_{n+1}^{11} (W_i - L)\ X_i + \frac{L^2}{2M} \sum_{n+1}^{11} X_i$$

And the probability of diversion is:

$$P(D) = \sum_{n+1}^{11} \frac{(W_i - L) X_i}{M}$$

General Derivation

This part of the derivation is concerned with finding the delays corresponding to arbitrary values of L ($0 < L < 600$) which may not correspond to the discrete values of T_i listed earlier.

A value of n may be found such that

$$T_n \leq L < T_{n+1}$$

$$D_s = \sum_{i=1}^{n} \frac{W_i^2 X_i}{2M} + F_1$$

$$D_d = F_2 + \frac{L}{M} \sum_{n+2}^{11} (W_i - L)\ X_i$$

$$D_e = F_3 + \frac{L^2}{2M} \sum_{n+2}^{11} X_i$$

and $$P(D) = P_1 + \sum_{n+2}^{11} \frac{(W_i - L)\, X_i}{M}$$

F_1, F_2, F_3, and P_1 are all functions of

L, X_{n+1}, T_n, and T_{n+1}

(The quantities with the subscript 'L' correspond to the interval between T_n and L.)

$$D_s = \sum_{i=1}^{n} P_i(E)\, D_a + P_L(E)\, D_L$$

$$P_L(E) = \frac{W_L\, X_L}{M}$$

$$D_L = \frac{W_L}{2}$$

W_L is the average duration of weather between T_n and L

$$W_L = \frac{T_n + L}{2}$$

X_L is the number of occurrences of weather in the interval between T_n and L

$$X_L = y\, X_{n+1} \quad , \quad y = \frac{L - T_n}{T_{n+1} - T_n} \quad , \quad \text{if we}$$

assume that the occurrences X_{n+1} occur uniformly over the interval.

$$\text{So, } F_1 = P_L(E)\, D_L = \frac{(T_n + L)^2}{8M} X_{n+1} \frac{(L - T_n)}{T_{n+1} - T_n}$$

$$\text{and } D_s = \sum_{i=1}^{n} \frac{W_i^2 X_i}{2M} + \frac{(T_n + L)^2}{8M} X_{n+1} \frac{(L - T_n)}{T_{n+1} - T_n} \qquad (1)$$

Let us also define W_L^1 and X_L^1, which correspond to the interval between L and T_{n+1}.

$$W_L^1 = \frac{L + T_{n+1}}{2}$$

$$X_L^1 = X_{n+1} - X_L = X_{n+1}(1-y) = X_{n+1}\frac{(T_{n+1} - L)}{T_{n+1} - T_n}$$

Using these values,

$$D_e = \frac{L^2}{2M}\left[X_{n+1}\left(\frac{T_{n+1} - L}{T_{n+1}-T_n}\right) + \sum_{n+2}^{11} X_i\right] \quad (2)$$

$$D_d = L\,P(D) \quad (3)$$

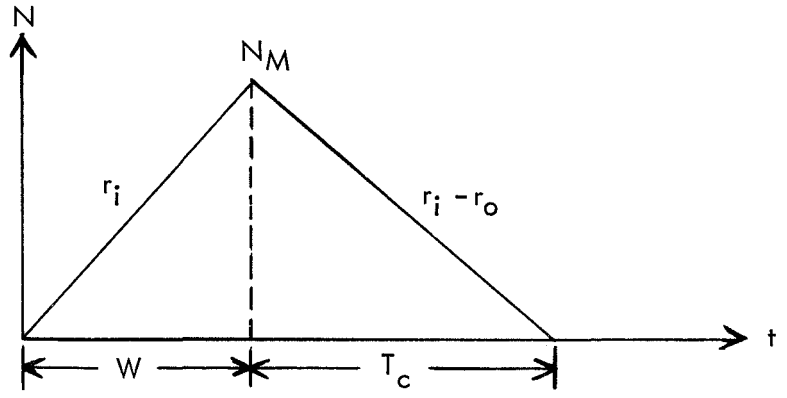
$$P(D) = \frac{\left(\frac{L+T_{n+1}}{2} - L\right) X_{n+1}\,\frac{T_{n+1} - L}{T_{n+1}-T_n}}{M} + \sum_{n+2}^{11}\frac{(W_i - L)X_i}{M} \quad (4)$$

Equations 1, 2 and 3 can be used to find the average delays expected for an arbitrary value of L. (See Table A-1) These equations can be shown to be equivalent to the original equations (for $L = T_n$) by substituting values T_n and T_{n+1} for L. However, these equations take into account only the delay which occurs up to the time at which the weather clears. There is an additional delay component due to the fact that aircraft have accumulated during the bad weather and they must await their sequential turn before landing. A delay due to traffic accumulation can be experienced by those aircraft arriving in bad weather and those aircraft arriving after the weather clears but before the congestion is relieved.

Let us define these additional quantities:

r_i	average aircraft arrival rate in the terminal area.
r_o	maximum landing rate in IFR conditions.
N	the number of aircraft in the terminal area awaiting landing at any given time.
T_c	the length of time after the weather has cleared ($t > W$) required to land all waiting aircraft (reduce N to zero).

The graph below shows the relationship between N and time, t. Note that the slope of the first part of the curve is r_i, since no landings are occurring. The slope of the second part is $r_i - r_o$, since landings are occurring.



$N_M = r_i W$, the maximum value of N

$$T_c = \frac{N_M}{r_o - r_i} = \frac{r_i}{r_o - r_i} W$$

The two situations are as follows:

Situation One - an aircraft encounters the terminal area during the period of low visibility ($0 < t < W$)

Situation Two - an aircraft encounters the terminal area after the weather has cleared, but before all of the waiting aircraft have been landed ($W \leq t < W + T_c$)

Note that situation one is the situation actually used in the computation of delays and diversion probabilities earlier in this appendix. Situation two was not considered there, so a relationship between the two must be established.

In this appendix, the relationships were derived for computing the following quantities at a specific value of loiter capability, L.

D_s	the average delay due to short periods of low visibility ($L > W$).
D_e	the average delay due to arrival near the end of a long period of low visibility ($L < W$)
D_d	the average delay experienced before a diversion occurs ($L < W$).
P(D)	the probability of a diversion ($L < W$).

For Situation 1, we notice that the actual delay experienced, due to the poor weather alone, is further compounded by traffic congestion.

$$\text{Average delay due to weather} = \frac{W}{2}$$

$$\text{Average additional delay due to traffic} = 1/2\ \frac{N_M}{r_o}$$

These values are based on the assumption that the aircraft may arrive at any time during W with equal probability. After the weather has cleared, the total time required to land all the aircraft that arrived during W and endured the delay is N_M/r_o. So the average delay

for situation one is:

$$D = \frac{W}{2} + \frac{1}{2}\frac{N_M}{r_o} = \frac{W}{2} + \frac{1}{2}\frac{r_i W}{r_o}$$

$$= \frac{W}{2}\ \frac{(r_o + r_i)}{r_o}$$

However the delay computations are made at the loiter capability, L, as if there were no additional delay due to traffic. Thus, to work with the weather statistics, it is necessary to suitably shorten the loiter capability of the aircraft to account for the additional delay due to traffic congestion. To accomplish this, we introduce a coefficient of delay propagation, CDP, defined as $CDP = \frac{r_o + r_i}{r_o}$ and a modified value of loiter capability $L' = \frac{L}{CDP}$.

The modified loiter capability, L' is used to find the values of D_s, D_e, D_d and P (D). If situation two were not to be considered, then we could establish our final values for delay and probability as:

$$D_{s'} = D_s\ CDP \quad (5)$$

$$D_{e'} = D_e\ CDP \quad (6)$$

$$D_{d'} = D_d\ CDP \quad (7)$$

$$P(D)' = P(D) \quad (8)$$

However situation two exists and must be considered. The result will be different multipliers for D_s and D_e. The values of D_d' and $P(D)'$ will not change since it is assumed that the probability of diversion of an aircraft that arrived after the weather cleared is very small. This results from the fact that there would be a number of aircraft that arrived during the poor weather like the one that just arrived, and these others would divert before the last one leaving fewer aircraft ahead to delay the landing. Further, once the weather has cleared, it should be possible to accurately anticipate further delays and to avoid sending an aircraft to an airport where the probability of landing is extremely low.

As discussed earlier, the average delay per landing is the average delay given the encounter multiplied by the probability of the encounter.

$$D_1 = AD_1 \cdot P(E)$$

Likewise for situation two,

$$D_2 = AD_2 \cdot P(E_c)$$

where P(Ec) is the probability of encountering the terminal area during the period T_c. From these the delay multiplier, DM, is defined as:

$$DM = \frac{D_1 + D_2}{D_1} \quad CDP$$

Let us evaluate D_1 and D_2.

$$D_1 = AD_1 \quad P(E) = \frac{W}{2} \quad \frac{(r_o + r_i)}{r_o} \quad P(E)$$

$$D_2 = AD_2 \quad P(E_c)$$

$AD_2 = 1/2 \quad \frac{N_M}{r_o}$, since the average number of waiting aircraft during T_c is one-half N_M.

$P(E_c) = \frac{T_c}{W} \quad P(E)$, that is, P(E) times the ratio of the periods of time that the probabilities refer to.

$$\frac{T_c}{W} = \frac{N_M}{r_o - r_i} \cdot \frac{1}{W} = \frac{r_i}{r_o - r_i}$$

so $$D_2 = \frac{W}{2} \quad \frac{r_i}{r_o} \quad \frac{r_i}{r_o - r_i} \quad P(E)$$

So the total delay is $D_1 + D_2$

$$D = D_1 + D_2 = \frac{W}{2r_o} P(E) \left(r_o + r_i + \frac{r_i^2}{r_o - r_i} \right)$$

$$D = \frac{W}{2} \frac{r_o}{r_o - r_i} P(E)$$

So, the value of DM, which includes the effects of both situations, is

$$DM = \frac{D_1 + D_2}{D_1} \cdot \quad CDP = \frac{\left(\frac{W}{2} P(E) \right) \frac{r_o}{r_o - r_i}}{\left(\frac{W}{2} P(E) \right) \frac{r_o + r_i}{r_o}} \qquad \frac{r_o + r_i}{r_o}$$

$$DM = \frac{r_o}{r_o - r_i}$$

So the final values of delays and probability of diversion are:

$$D_s' = D_s \cdot DM \tag{9}$$

$$D_e' = D_e \cdot DM \tag{10}$$

$$D_d' = D_d \cdot CDP \tag{11}$$

$$P(D)' = P(D) \tag{12}$$

where D_s, D_e, D_d, and P(D) are determined at $L' = L/CDP$.

These formulations of delay times and diversion probabilities are used in the economic benefit analysis of Section 3.

Two tables follow which present different computations made on the basic visibility data which was taken from the Climatological Summaries. Table A-1 shows the results of computations of mean delay per landing and diversion probability for three values of loiter capability at thirty-one airports. The results reflect only the effect of the visibility statistics, which are shown on the table for each airport, and not the effects of delay propagation or operating procedures or costs. The second table, A-2, shows the results of a complete solution of the poor visibility cost problem, as developed in this appendix. The effects of delay propagation, operating procedures (route structures), and operating costs are included in these computations for eight airports in the years 1967 and 1970.

TABLE A-1. MEAN DELAYS AND DIVERSION PROBABILITIES RESULTING SOLELY FROM THE VISIBILITY STATISTICS (4 pages)

AIRPORT	VISIBILITY (miles)	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES 0-15	15-30	30-45	45-60	60-90	90-120	120-180	180-240	240-360	360-480	480-600	MEAN DELAY PER LANDING.- FOR MAXIMUM DELAY OF (minutes) 30.00	60.00	120.00	PROBABILITY OF DIVERSION AFTER DELAY OF 30.00	60.00	120.00
ANCHORAGE AL	1/2	175	148	116	63	110	65	84	38	37	12	8	0.326205	0.559067	0.858327	0.0090848	0.0066307	0.0037189
ANCHORAGE AL	3/8	142	135	108	61	102	61	77	36	33	11	7	0.299736	0.512866	0.785175	0.0083348	0.0060546	0.0033710
ANCHORAGE AL	1/4	108	112	96	57	91	54	65	35	28	9	6	0.262598	0.448692	0.685195	0.0072967	0.0052732	0.0029204
ANCHORAGE AL	3/16	77	77	54	38	51	43	34	26	15	4	2	0.153416	0.259828	0.389320	0.0042151	0.0029774	0.0015400
ANCHORAGE AL	1/8	68	74	52	31	42	39	32	21	8	4	1	0.124861	0.209109	0.307521	0.0033753	0.0023300	0.0011237
ANCHORAGE AL	1/16	23	17	19	8	19	9	2	5	1	0	1	0.027935	0.044934	0.062815	0.0007173	0.0004449	0.0002110
ANCHORAGE AL	0	6	3	2	0	0	1	0	0	1	0	0	0.002572	0.004379	0.006968	0.0000684	0.0000542	0.0000342
ATLANTA,GA.	1/2	108	72	58	52	71	46	47	34	34	20	20	0.305891	0.545042	0.893940	0.0089722	0.0071156	0.0047513
ATLANTA,GA.	3/8	99	66	55	47	64	44	46	32	33	19	19	0.290752	0.519266	0.852514	0.0085444	0.0067990	0.0045403
ATLANTA,GA.	1/4	74	54	57	38	70	36	45	28	32	21	16	0.275111	0.491482	0.806890	0.0080923	0.0064339	0.0043064
ATLANTA,GA.	3/16	34	29	32	20	24	20	31	19	20	9	10	0.156694	0.281801	0.466520	0.0046429	0.0037531	0.0024983
ATLANTA,GA.	1/8	28	26	24	18	18	16	28	19	15	8	9	0.135213	0.243754	0.404646	0.0040184	0.0032626	0.0021732
ATLANTA,GA.	1/16	9	5	4	6	6	4	6	2	2	4	1	0.028523	0.050992	0.083718	0.0008413	0.0006674	0.0004449
ATLANTA,GA.	0	1	1	4	0	1	1	3	0	2	1	0	0.009294	0.016673	0.027496	0.0002738	0.0002225	0.0001426
BALTIMORE	1/2	65	80	62	35	52	42	71	36	31	26	39	0.380952	0.693457	1.172880	0.0114348	0.0095026	0.0066792
BALTIMORE	3/8	60	70	57	32	49	40	67	33	30	25	37	0.360765	0.657442	1.113144	0.0108473	0.0090263	0.0063541
BALTIMORE	1/4	44	47	46	26	46	40	53	26	28	23	33	0.317435	0.579798	0.983418	0.0095825	0.0079854	0.0056525
BALTIMORE	3/16	18	25	27	21	29	36	30	10	27	18	24	0.229225	0.420575	0.717996	0.0069644	0.0058436	0.0042094
BALTIMORE	1/8	18	27	23	18	24	26	30	12	27	12	22	0.203697	0.374005	0.639277	0.0061901	0.0052076	0.0037417
BALTIMORE	1/16	3	9	8	11	10	14	10	10	15	7	10	0.103760	0.191259	0.328323	0.0031728	0.0026808	0.0019393
BALTIMORE	0	1	3	7	11	4	9	5	3	4	3	3	0.038993	0.069847	0.115471	0.0011550	0.0009212	0.0006274
BIRMINGHAM,	1/2	45	21	7	15	17	16	11	4	11	2	1	0.057805	0.100402	0.155865	0.0016456	0.0012178	0.0007016
BIRMINGHAM,	3/8	44	19	6	13	17	15	10	4	10	2	1	0.054238	0.094338	0.146528	0.0015472	0.0011465	0.0006616
BIRMINGHAM,	1/4	41	16	6	14	16	13	10	4	10	2	1	0.052923	0.092215	0.143999	0.0015144	0.0011265	0.0006616
BIRMINGHAM,	3/16	12	7	8	3	10	9	5	3	6	2	1	0.034667	0.061291	0.097803	0.0010082	0.0007786	0.0004791
BIRMINGHAM,	1/8	12	7	8	3	10	9	5	3	6	2	1	0.034667	0.061291	0.097803	0.0010082	0.0007786	0.0004791
BIRMINGHAM,	1/16	7	4	5	0	8	7	4	1	6	0	1	0.024143	0.042822	0.067954	0.0007059	0.0005447	0.0003251
BIRMINGHAM,	0	4	5	1	1	6	3	3	2	2	0	1	0.014978	0.026496	0.041918	0.0004363	0.0003337	0.0001996
BOSTON	1/2	94	105	59	58	80	49	69	37	32	14	10	0.286656	0.501091	0.790811	0.0082064	0.0062144	0.0037189
BOSTON	3/8	88	99	57	55	75	47	66	34	28	12	9	0.262935	0.458135	0.718958	0.0074977	0.0056354	0.0033196
BOSTON	1/4	63	83	45	50	61	43	57	38	22	12	7	0.234354	0.409485	0.643914	0.0067120	0.0050650	0.0029717
BOSTON	3/16	36	35	29	22	40	22	30	12	12	8	2	0.115712	0.200772	0.311954	0.0032897	0.0024355	0.0014031
BOSTON	1/8	39	31	29	22	39	22	27	13	12	7	2	0.111685	0.193580	0.300292	0.0031728	0.0023414	0.0013461
BOSTON	1/16	13	15	8	9	21	7	9	6	8	0	1	0.044126	0.076088	0.116556	0.0012477	0.0009012	0.0005076
BOSTON	0	1	3	3	1	3	1	5	0	0	0	0	0.006139	0.010053	0.013732	0.0001626	0.0001027	0.0000285
BUFFALO	1/2	125	84	73	44	62	48	39	25	24	12	9	0.220873	0.383288	0.603642	0.0062471	0.0047057	0.0028747
BUFFALO	3/8	118	79	68	40	61	45	36	24	23	12	9	0.212167	0.368973	0.582911	0.0060176	0.0045517	0.0028063
BUFFALO	1/4	91	66	52	40	47	34	31	20	20	9	8	0.175805	0.306003	0.485011	0.0049937	0.0037845	0.0023557
BUFFALO	3/16	34	30	23	27	29	27	19	11	11	4	7	0.109086	0.190762	0.301987	0.0031314	0.0023671	0.0014602
BUFFALO	1/8	29	29	20	23	24	22	22	7	10	4	5	0.093739	0.163570	0.257641	0.0026822	0.0020192	0.0012149
BUFFALO	1/16	8	17	10	5	8	12	4	5	5	1	1	0.034186	0.059292	0.092231	0.0009654	0.0007244	0.0004164
BUFFALO	0	2	6	0	1	3	0	2	2	0	0	0	0.005305	0.008946	0.013117	0.0001440	0.0000998	0.0000456
BURBANK	1/2	40	50	41	37	34	32	41	20	26	4	8	0.173137	0.304244	0.484984	0.0049909	0.0038330	0.0023329
BURBANK	3/8	40	49	38	34	32	29	40	19	24	3	8	0.161881	0.284528	0.453847	0.0046658	0.0035877	0.0021846
BURBANK	1/4	33	45	27	27	35	19	37	15	21	4	6	0.139833	0.246086	0.392518	0.0040383	0.0031029	0.0018937
BURBANK	3/16	31	37	28	22	21	21	28	19	9	2	6	0.108124	0.189072	0.298629	0.0030943	0.0023557	0.0013860
BURBANK	1/8	32	30	22	20	17	18	27	13	6	2	5	0.088370	0.154047	0.241722	0.0025211	0.0019022	0.0010951
BURBANK	1/16	22	20	13	8	9	8	16	10	2	2	3	0.051944	0.091328	0.145421	0.0014930	0.0011550	0.0006845
BURBANK	0	8	8	7	7	5	4	10	2	3	1	0	0.023700	0.040672	0.062083	0.0006645	0.0004820	0.0002510
CHICAGO, OH	1/2	62	55	38	29	32	33	40	26	25	8	11	0.193730	0.345055	0.561537	0.0056682	0.0044918	0.0028633
CHICAGO, OH	3/8	59	51	36	26	30	30	40	24	24	7	11	0.184238	0.328563	0.535528	0.0053987	0.0042893	0.0027379
CHICAGO, OH	1/4	41	42	25	19	25	34	37	19	22	7	10	0.167025	0.299233	0.488038	0.0049281	0.0039328	0.0024869
CHICAGO, OH	3/16	20	15	13	17	18	20	29	7	11	5	9	0.109059	0.195933	0.320975	0.0032398	0.0025838	0.0016655
CHICAGO, OH	1/8	19	11	10	17	19	17	24	7	10	7	7	0.100434	0.180618	0.296549	0.0029902	0.0023842	0.0015572
CHICAGO, OH	1/16	10	7	4	9	12	10	8	8	5	4	4	0.056474	0.101846	0.168025	0.0016869	0.0013518	0.0009012
CHICAGO, OH	0	3	3	4	4	7	5	8	4	5	2	2	0.035838	0.064714	0.106551	0.0010723	0.0008613	0.0005590
CINCINNATI	1/2	52	46	38	45	52	32	37	19	26	19	16	0.234910	0.420800	0.695355	0.0069373	0.0055441	0.0037874
CINCINNATI	3/8	50	46	35	43	49	29	35	18	25	18	15	0.221937	0.397619	0.657501	0.0065537	0.0052418	0.0035877
CINCINNATI	1/4	41	40	33	40	46	23	32	19	24	17	15	0.211461	0.379973	0.631791	0.0062671	0.0050451	0.0034965
CINCINNATI	3/16	23	22	20	20	29	13	23	14	15	13	7	0.133283	0.240102	0.398940	0.0039642	0.0031999	0.0021846
CINCINNATI	1/8	23	22	20	20	27	12	23	14	15	13	7	0.132085	0.238220	0.396822	0.0039328	0.0031856	0.0021846
CINCINNATI	1/16	10	8	5	11	11	7	10	7	9	5	3	0.061441	0.111107	0.184901	0.0018395	0.0014887	0.0010096
CINCINNATI	0	6	4	5	4	8	5	4	5	6	2	2	0.036544	0.065938	0.109017	0.0010909	0.0008784	0.0005875

AIRPORT	VISIBILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES											MEAN DELAY PER LANDING - FOR MAXIMUM DELAY OF			PROBABILITY OF DIVERSION AFTER DELAY OF		
		0-15	30	45	60	90	120	180	240	360	480	600	30.00	60.00	120.00	30.00	60.00	120.00
CLEVELAND	1/2	160	65	42	19	36	21	28	22	24	11	7	0.167955	0.298115	0.487049	0.0048668	0.0038758	0.0025439
CLEVELAND	3/8	150	60	37	17	32	18	26	21	22	10	6	0.152475	0.270790	0.442633	0.0044205	0.0035250	0.0023101
CLEVELAND	1/4	91	45	27	17	23	16	20	21	18	10	6	0.134925	0.241551	0.399127	0.0039585	0.0031970	0.0021389
CLEVELAND	3/16	28	21	16	11	14	6	14	17	13	7	3	0.089413	0.161212	0.268416	0.0026537	0.0021618	0.0014545
CLEVELAND	1/8	26	17	17	10	13	5	15	16	12	6	3	0.083991	0.151298	0.251444	0.0024912	0.0020249	0.0013518
CLEVELAND	1/16	7	11	4	4	11	1	18	7	3	1	3	0.044030	0.078809	0.127492	0.0013005	0.0010267	0.0006217
CLEVELAND	0	4	9	3	5	1	1	3	3	1	1	0	0.012347	0.021331	0.033865	0.0003451	0.0002624	0.0001597
COLUMBUS, O	1/2	88	54	48	22	29	28	37	31	19	12	12	0.195745	0.350124	0.576189	0.0057438	0.0046230	0.0030345
COLUMBUS, O	3/8	84	51	45	21	28	27	35	29	18	11	11	0.183430	0.327735	0.538185	0.0053759	0.0043150	0.0028177
COLUMBUS, O	1/4	70	44	30	19	28	25	32	27	19	8	11	0.169800	0.304602	0.500978	0.0050094	0.0040298	0.0026295
COLUMBUS, O	3/16	30	17	23	11	17	19	26	17	15	8	9	0.130599	0.236573	0.393914	0.0039071	0.0031942	0.0021275
COLUMBUS, O	1/8	31	17	19	12	18	17	26	16	16	6	9	0.125513	0.227236	0.377711	0.0037546	0.0030601	0.0020306
COLUMBUS, O	1/16	17	13	11	12	10	16	14	12	8	4	7	0.083665	0.151122	0.250583	0.0024969	0.0020249	0.0013461
COLUMBUS, O	0	17	14	8	7	6	9	10	8	8	1	5	0.056848	0.102744	0.170998	0.0016926	0.0013832	0.0009240
DALLAS, TEX	1/2	23	15	11	15	16	18	15	6	4	6	2	0.064757	0.113364	0.178088	0.0018652	0.0014031	0.0008271
DALLAS, TEX	3/8	22	14	10	15	9	17	14	5	3	5	2	0.055848	0.097776	0.153945	0.0016071	0.0012149	0.0007130
DALLAS, TEX	1/4	21	15	11	13	10	16	13	5	3	5	2	0.054650	0.095718	0.151031	0.0015714	0.0011921	0.0007073
DALLAS, TEX	3/16	12	9	9	3	13	7	2	4	5	2	1	0.032068	0.056217	0.089328	0.0009212	0.0007016	0.0004449
DALLAS, TEX	1/8	11	7	10	3	10	6	2	3	5	2	1	0.029443	0.051800	0.083285	0.0008484	0.0006559	0.0004278
DALLAS, TEX	1/16	3	2	5	2	4	3	0	3	3	1	0	0.014614	0.025774	0.041496	0.0004235	0.0003280	0.0002110
DALLAS, TEX	0	1	1	1	4	1	1	0	3	2	0	0	0.008481	0.014924	0.024036	0.0002467	0.0001882	0.0001198
DAYTON,OHIO	1/2	53	58	39	42	51	31	34	23	32	14	25	0.261416	0.472065	0.791581	0.0077815	0.0063484	0.0044775
DAYTON,OHIO	3/8	51	52	36	40	46	30	32	22	29	13	24	0.245246	0.443120	0.743513	0.0073066	0.0059662	0.0042094
DAYTON,OHIO	1/4	45	39	29	36	36	28	33	22	24	13	24	0.231027	0.419602	0.708103	0.0069316	0.0057096	0.0040440
DAYTON,OHIO	3/16	18	19	21	22	18	16	24	17	22	8	18	0.168319	0.308350	0.526737	0.0051035	0.0042779	0.0030744
DAYTON,OHIO	1/8	15	20	21	20	17	17	21	19	21	7	18	0.164073	0.300671	0.513753	0.0049752	0.0041752	0.0030002
DAYTON,OHIO	1/16	7	7	12	10	14	16	14	16	13	10	6	0.107835	0.196933	0.331387	0.0032655	0.0026979	0.0018480
DAYTON,OHIO	0	4	5	7	8	10	11	8	10	12	7	2	0.070890	0.129064	0.215926	0.0021404	0.0017539	0.0011864
DENVER, COLO	1/2	46	39	26	30	28	16	23	12	5	1	0	0.071168	0.117498	0.169089	0.0018994	0.0012491	0.0005647
DENVER, COLO	3/8	43	34	23	27	27	15	21	11	4	1	0	0.064751	0.106814	0.153058	0.0017283	0.0011294	0.0005019
DENVER, COLO	1/4	32	21	25	20	25	15	16	9	4	1	0	0.056067	0.092584	0.132625	0.0015015	0.0009811	0.0004392
DENVER, COLO	3/16	14	13	10	12	9	5	11	3	3	0	0	0.026881	0.044538	0.064516	0.0007215	0.0004791	0.0002167
DENVER, COLO	1/8	11	11	10	10	10	5	10	4	2	0	0	0.025400	0.042020	0.060308	0.0006816	0.0004478	0.0001939
DENVER, COLO	1/16	2	6	6	5	1	3	6	3	0	0	0	0.011978	0.019865	0.028678	0.0003208	0.0002167	0.0000856
DENVER, COLO	0	4	1	0	0	1	2	3	2	0	0	0	0.005973	0.010508	0.015705	0.0001740	0.0001283	0.0000513
DETROIT	1/2	60	58	34	36	46	37	38	41	42	24	19	0.305388	0.555249	0.933992	0.0091718	0.0075605	0.0052418
DETROIT	3/8	56	55	31	32	45	36	38	40	38	22	19	0.290891	0.528993	0.889042	0.0087397	0.0072011	0.0049738
DETROIT	1/4	50	42	23	26	41	37	34	39	34	22	16	0.267389	0.487193	0.818259	0.0080610	0.0066450	0.0045574
DETROIT	3/16	16	22	21	17	27	27	36	28	20	19	11	0.198783	0.362273	0.606926	0.0060005	0.0049395	0.0033311
DETROIT	1/8	14	24	18	17	28	27	35	25	19	18	11	0.190783	0.347413	0.581135	0.0057538	0.0047256	0.0031828
DETROIT	1/16	5	17	16	8	9	14	24	9	13	7	6	0.098637	0.179105	0.299035	0.0029574	0.0024327	0.0016142
DETROIT	0	2	9	6	4	7	8	13	4	7	2	2	0.045019	0.080836	0.131465	0.0013347	0.0010638	0.0006559
HARTFORD,CON	1/2	66	95	66	36	58	45	83	38	53	17	23	0.364524	0.655795	1.083562	0.0107917	0.0087355	0.0057438
HARTFORD,CON	3/8	59	78	58	34	54	42	79	36	50	16	22	0.343819	0.619636	1.025180	0.0102099	0.0082763	0.0054472
HARTFORD,CON	1/4	46	57	41	38	45	35	75	33	45	15	17	0.302912	0.546148	0.901897	0.0090164	0.0072838	0.0047456
HARTFORD,CON	3/16	25	26	28	23	34	34	56	23	28	11	9	0.205569	0.369128	0.600905	0.0061046	0.0048540	0.0030173
HARTFORD,CON	1/8	23	23	25	25	37	28	49	21	28	10	9	0.193478	0.347365	0.566756	0.0057466	0.0045659	0.0028862
HARTFORD,CON	1/16	8	13	11	18	19	21	24	15	8	6	6	0.103209	0.184473	0.298436	0.0030530	0.0023956	0.0014887
HARTFORD,CON	0	5	9	4	11	11	11	10	7	6	5	2	0.055516	0.099359	0.161603	0.0016441	0.0012948	0.0008271
HOUSTON	1/2	103	99	71	49	72	52	72	51	53	37	30	0.449874	0.814778	1.365684	0.0134297	0.0110256	0.0076032
HOUSTON	3/8	97	97	70	48	70	52	69	48	50	36	28	0.429896	0.777635	1.301120	0.0128137	0.0104951	0.0072154
HOUSTON	1/4	82	92	66	42	65	50	63	39	53	35	25	0.403993	0.731573	1.226161	0.0120551	0.0098990	0.0068332
HOUSTON	3/16	44	50	38	29	42	32	38	38	43	18	15	0.272448	0.494102	0.826964	0.0081579	0.0066906	0.0045631
HOUSTON	1/8	38	45	38	28	33	28	33	31	39	16	13	0.238081	0.431452	0.722969	0.0071184	0.0058436	0.0040041
HOUSTON	1/16	21	14	21	15	18	17	16	15	10	6	1	0.083691	0.147325	0.234145	0.0024241	0.0018566	0.0011123
HOUSTON	0	4	9	7	3	3	5	4	4	1	0	0	0.014743	0.024764	0.036400	0.0003993	0.0002795	0.0001255
INDIANAPOLI	1/2	61	46	36	34	55	28	41	21	23	13	12	0.205911	0.366193	0.595210	0.0060290	0.0047313	0.0030801
INDIANAPOLI	3/8	62	45	34	32	51	26	39	21	21	13	11	0.195002	0.346878	0.564131	0.0057096	0.0044861	0.0029204
INDIANAPOLI	1/4	54	43	27	23	45	25	39	17	23	8	11	0.176725	0.315211	0.512636	0.0051905	0.0040954	0.0026352
INDIANAPOLI	3/16	23	14	14	18	24	15	22	10	14	3	10	0.110054	0.197836	0.326152	0.0032712	0.0026152	0.0017454
INDIANAPOLI	1/8	22	16	13	16	24	13	22	10	15	3	9	0.107193	0.192821	0.318013	0.0031870	0.0025525	0.0016997
INDIANAPOLI	1/16	6	6	9	11	12	8	10	5	8	2	2	0.048918	0.086542	0.138989	0.0014288	0.0011008	0.0006902
INDIANAPOLI	0	2	5	2	0	4	1	3	4	2	0	1	0.015395	0.027726	0.045458	0.0004563	0.0003679	0.0002339

AIRPORT	VISIBILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES											MEAN DELAY PER LANDING - FOR MAXIMUM DELAY OF			PROBABILITY OF DIVERSION AFTER DELAY OF		
		0-15-	30-	45-	60-	90-	120-	180-	240-	360-	480-	600	30.00	60.00	120.00	30.00	60.00	120.00
LOS ANGELES	1/2	73	84	48	47	74	52	74	31	53	35	32	0.426960	0.775731	1.303409	0.0128123	0.0105407	0.0073180
LOS ANGELES	3/8	69	76	46	44	69	51	71	30	52	34	31	0.413078	0.751342	1.264004	0.0124144	0.0102327	0.0071127
LOS ANGELES	1/4	58	56	47	35	59	48	51	25	52	33	26	0.367054	0.669212	1.131117	0.0110626	0.0091689	0.0064568
LOS ANGELES	3/16	33	39	44	25	52	38	36	30	45	29	22	0.317462	0.580194	0.984241	0.0095982	0.0079911	0.0056696
LOS ANGELES	1/8	41	36	35	21	39	40	33	26	46	22	19	0.281640	0.515042	0.872310	0.0085216	0.0070984	0.0049795
LOS ANGELES	1/16	25	29	19	13	46	22	19	26	36	15	11	0.203446	0.370925	0.623920	0.0061402	0.0050593	0.0035193
LOS ANGELES	0	13	14	7	8	20	11	18	15	21	5	3	0.101060	0.183276	0.303206	0.0030359	0.0024612	0.0016028
LOUISVILLE K	1/2	36	20	18	15	16	13	20	15	20	6	5	0.112252	0.202392	0.335627	0.0033382	0.0027065	0.0017967
LOUISVILLE K	3/8	33	18	18	14	15	10	20	14	18	5	4	0.100375	0.180457	0.298035	0.0029746	0.0023985	0.0015743
LOUISVILLE K	1/4	25	15	17	11	15	14	19	10	16	5	4	0.093001	0.167030	0.274427	0.0027550	0.0022102	0.0014317
LOUISVILLE K	3/16	8	10	11	8	9	9	10	12	9	2	3	0.060628	0.108813	0.178500	0.0017953	0.0014374	0.0009240
LOUISVILLE K	1/8	7	8	8	8	10	8	10	9	7	2	3	0.053383	0.095648	0.156266	0.0015800	0.0012548	0.0008042
LOUISVILLE K	1/16	5	7	3	6	9	6	3	11	2	1	3	0.037282	0.066847	0.109263	0.0011051	0.0008755	0.0005704
LOUISVILLE K	0	1	0	0	1	2	0	2	1	1	0	1	0.008176	0.014983	0.025293	0.0002495	0.0002053	0.0001426
MIAMI,FLA.	1/2	40	25	19	10	12	10	13	11	10	3	0	0.060666	0.105824	0.167212	0.0017240	0.0013176	0.0007757
MIAMI,FLA.	3/8	38	24	18	10	11	9	12	10	9	3	0	0.056115	0.097760	0.154485	0.0015914	0.0012149	0.0007187
MIAMI,FLA.	1/4	35	23	17	9	13	7	13	9	9	3	0	0.055024	0.095932	0.151630	0.0015629	0.0011921	0.0007073
MIAMI,FLA.	3/16	11	12	5	3	16	7	9	6	3	2	0	0.034089	0.059072	0.089852	0.0009697	0.0007044	0.0003708
MIAMI,FLA.	1/8	13	10	5	4	15	6	9	6	3	2	0	0.033362	0.057880	0.088445	0.0009511	0.0006930	0.0003708
MIAMI,FLA.	1/16	3	6	1	5	5	4	5	2	1	0	0	0.012967	0.021769	0.031202	0.0003565	0.0002367	0.0000970
MIAMI,FLA.	0	2	3	1	0	2	2	1	0	0	0	0	0.002765	0.004396	0.005508	0.0000699	0.0000399	0.0000057
MILWAUKEE	1/2	91	79	53	52	45	52	64	40	47	21	21	0.345878	0.622706	1.031693	0.0102598	0.0083077	0.0055327
MILWAUKEE	3/8	86	76	51	51	44	51	61	38	45	20	21	0.334285	0.601814	0.997240	0.0099162	0.0080282	0.0053559
MILWAUKEE	1/4	63	68	41	48	46	50	55	34	46	18	20	0.316965	0.571291	0.946718	0.0094242	0.0076261	0.0050935
MILWAUKEE	3/16	18	32	14	25	34	40	29	26	31	7	13	0.197692	0.357081	0.588301	0.0059106	0.0047570	0.0031086
MILWAUKEE	1/8	15	31	14	25	35	40	29	26	31	6	13	0.195660	0.353081	0.580558	0.0058450	0.0046914	0.0030516
MILWAUKEE	1/16	5	12	10	9	14	7	11	9	7	7	4	0.070205	0.126989	0.212141	0.0020976	0.0017083	0.0011750
MILWAUKEE	0	2	7	3	2	4	4	3	2	5	1	1	0.022550	0.040629	0.067152	0.0006688	0.0005419	0.0003593
MINNEAPOLIS	1/2	60	40	35	20	28	16	24	7	13	3	8	0.107097	0.187388	0.300581	0.0030558	0.0023557	0.0015115
MINNEAPOLIS	3/8	53	37	33	17	27	15	22	7	12	2	7	0.096691	0.168699	0.269015	0.0027493	0.0021047	0.0013290
MINNEAPOLIS	1/4	33	30	17	5	24	15	19	6	10	2	7	0.083927	0.149111	0.241150	0.0024441	0.0019251	0.0012263
MINNEAPOLIS	3/16	20	12	6	10	11	15	10	5	5	3	2	0.049367	0.086927	0.137277	0.0014317	0.0010894	0.0006445
MINNEAPOLIS	1/8	15	11	8	9	10	14	9	4	3	3	1	0.040351	0.070088	0.108247	0.0011508	0.0008499	0.0004734
MINNEAPOLIS	1/16	2	3	4	3	6	5	5	1	1	1	1	0.017823	0.031079	0.048255	0.0005119	0.0003793	0.0002167
MINNEAPOLIS	0	1	0	0	2	2	0	2	0	0	0	0	0.002658	0.004294	0.005706	0.0000713	0.0000399	0.0000114
NASHVILLE	1/2	45	53	36	27	38	19	31	17	17	11	6	0.149737	0.263994	0.425891	0.0043221	0.0033624	0.0021561
NASHVILLE	3/8	42	48	34	24	34	18	28	17	17	11	5	0.141395	0.249850	0.404282	0.0040925	0.0031999	0.0020591
NASHVILLE	1/4	32	40	27	21	40	16	22	16	16	10	5	0.130775	0.231263	0.373802	0.0037959	0.0029546	0.0019165
NASHVILLE	3/16	10	12	22	7	19	13	20	12	10	6	4	0.088969	0.159068	0.259171	0.0026223	0.0020819	0.0013233
NASHVILLE	1/8	10	13	17	8	22	12	19	10	10	6	4	0.086109	0.153918	0.250470	0.0025396	0.0020078	0.0012834
NASHVILLE	1/16	3	8	8	7	10	7	14	4	10	3	2	0.054345	0.097589	0.159726	0.0016128	0.0012862	0.0008214
NASHVILLE	0	2	5	4	4	2	6	2	1	4	2	0	0.019160	0.034004	0.055051	0.0005590	0.0004392	0.0002795
NEW ORLEANS	1/2	83	62	55	30	73	36	52	30	44	17	24	0.316441	0.570489	0.948248	0.0094042	0.0076232	0.0052019
NEW ORLEANS	3/8	79	60	54	29	72	35	50	28	43	16	24	0.307425	0.554233	0.921511	0.0091361	0.0074065	0.0050650
NEW ORLEANS	1/4	72	60	54	29	71	34	44	29	40	17	23	0.297463	0.536057	0.891828	0.0088338	0.0071612	0.0049224
NEW ORLEANS	3/16	22	35	21	18	36	27	26	18	27	12	13	0.185110	0.335643	0.560639	0.0055456	0.0045317	0.0031029
NEW ORLEANS	1/8	21	33	21	19	35	24	26	19	26	12	11	0.176837	0.320061	0.533164	0.0052875	0.0043036	0.0029261
NEW ORLEANS	1/16	10	14	9	8	13	8	12	10	6	3	1	0.052190	0.092151	0.146673	0.0015158	0.0011664	0.0006959
NEW ORLEANS	0	3	5	5	1	6	4	2	1	1	0	0	0.009497	0.015561	0.021593	0.0002510	0.0001597	0.0000627
NEWARK N.J.	1/2	67	90	44	27	54	27	40	23	25	11	12	0.206820	0.366209	0.594327	0.0059876	0.0047142	0.0030630
NEWARK N.J.	3/8	61	81	39	26	49	24	36	21	23	9	11	0.186077	0.329221	0.533726	0.0053830	0.0042294	0.0027436
NEWARK N.J.	1/4	45	51	26	25	36	19	30	22	13	6	10	0.145962	0.258614	0.418757	0.0042422	0.0033225	0.0021332
NEWARK N.J.	3/16	19	14	23	13	18	16	19	13	7	4	9	0.097541	0.174607	0.286902	0.0028776	0.0022987	0.0015172
NEWARK N.J.	1/8	14	11	17	13	20	13	14	14	3	3	9	0.084194	0.150534	0.246893	0.0024840	0.0019707	0.0013119
NEWARK N.J.	1/16	5	11	7	3	13	6	7	7	2	0	9	0.053003	0.096563	0.163362	0.0015942	0.0013204	0.0009468
NEWARK N.J.	0	1	8	5	3	7	8	4	3	2	1	6	0.038121	0.069435	0.117326	0.0011465	0.0009497	0.0006788
NEW YORK,N.Y	1/2	132	118	88	73	60	61	80	50	42	17	22	0.375781	0.665442	1.079221	0.0109072	0.0085757	0.0054757
NEW YORK,N.Y	3/8	120	105	79	66	57	55	76	44	35	15	21	0.339584	0.600969	0.973145	0.0098520	0.0077287	0.0049167
NEW YORK,N.Y	1/4	82	67	55	34	52	41	70	26	26	13	19	0.268849	0.479370	0.780640	0.0078813	0.0062486	0.0039927
NEW YORK,N.Y	3/16	44	50	28	23	42	31	34	15	17	10	12	0.170977	0.304505	0.495150	0.0050066	0.0039499	0.0025610
NEW YORK,N.Y	1/8	43	27	23	19	29	26	16	15	14	8	9	0.129010	0.230493	0.377460	0.0037959	0.0030145	0.0020021
NEW YORK,N.Y	1/16	21	20	7	7	11	9	10	8	5	5	3	0.057115	0.102407	0.168372	0.0016826	0.0013518	0.0008898
NEW YORK,N.Y	0	3	6	0	6	5	5	5	3	3	0	1	0.020924	0.036785	0.057703	0.0006075	0.0004563	0.0002624

AIRPORT	VISIBILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES											MEAN DELAY PER LANDING - FOR MAXIMUM DELAY OF			PROBABILITY OF DIVERSION AFTER DELAY OF		
		0-15	30	45	60	90-120	180-240	360-480	600				30.00	60.00	120.00	30.00	60.00	120.00
OAKLAND CALI	1/2	35	26	25	32	28	17	26	21	21	13	25	0.212210	0.388764	0.666763	0.0064325	0.0053987	0.0039642
OAKLAND CALI	3/8	32	25	25	29	26	16	25	21	19	13	24	0.203291	0.372684	0.639839	0.0061659	0.0051848	0.0038102
OAKLAND CALI	1/4	26	27	25	25	23	17	27	20	16	12	24	0.195227	0.358011	0.614343	0.0059206	0.0049852	0.0036448
OAKLAND CALI	3/16	12	22	20	17	21	17	22	17	14	10	20	0.164838	0.302570	0.518475	0.0050066	0.0042151	0.0030630
OAKLAND CALI	1/8	9	20	15	12	22	19	23	13	15	10	18	0.156341	0.287303	0.490952	0.0047584	0.0040013	0.0028747
OAKLAND CALI	1/16	10	6	14	16	19	16	16	9	14	8	17	0.134753	0.247850	0.425532	0.0041125	0.0034594	0.0025382
OAKLAND CALI	0	7	9	7	10	17	15	12	7	14	6	14	0.112594	0.207654	0.356696	0.0034466	0.0029090	0.0021275
PHILADELPHI	1/2	74	83	42	37	48	33	40	21	36	17	19	0.259909	0.467509	0.778790	0.0076817	0.0062429	0.0043064
PHILADELPHI	3/8	66	76	40	34	46	30	38	20	35	17	19	0.252128	0.454611	0.760138	0.0074749	0.0061031	0.0042437
PHILADELPHI	1/4	46	47	27	23	38	23	32	19	32	15	15	0.213066	0.386716	0.649999	0.0063798	0.0052504	0.0036562
PHILADELPHI	3/16	23	27	23	12	14	25	18	12	22	13	10	0.147512	0.269277	0.456114	0.0044447	0.0037104	0.0026010
PHILADELPHI	1/8	22	25	16	12	13	17	19	12	23	10	10	0.137529	0.251984	0.429046	0.0041638	0.0034965	0.0024698
PHILADELPHI	1/16	9	15	6	9	11	12	12	11	7	7	2	0.068403	0.123198	0.202403	0.0020349	0.0016342	0.0010552
PHILADELPHI	0	3	3	3	4	2	7	7	2	5	1	1	0.026726	0.047982	0.077777	0.0007943	0.0006303	0.0003822
PITTSBURGH	1/2	111	56	43	31	47	30	34	35	34	12	13	0.233952	0.419110	0.690436	0.0068931	0.0055299	0.0036790
PITTSBURGH	3/8	101	55	39	28	45	27	34	34	31	11	13	0.222172	0.398352	0.656737	0.0065523	0.0052647	0.0035022
PITTSBURGH	1/4	57	48	32	19	40	20	30	34	25	11	11	0.194649	0.350338	0.579890	0.0057680	0.0046658	0.0031143
PITTSBURGH	3/16	44	19	21	10	21	13	31	25	16	8	8	0.139967	0.253668	0.421575	0.0041909	0.0034223	0.0022473
PITTSBURGH	1/8	37	19	21	8	21	12	30	21	13	9	6	0.125214	0.226242	0.374107	0.0037346	0.0030316	0.0019678
PITTSBURGH	1/16	15	14	14	4	16	9	20	14	5	9	3	0.082376	0.148609	0.244797	0.0024527	0.0019821	0.0012777
PITTSBURGH	0	10	12	11	5	16	5	15	8	6	6	2	0.061206	0.109674	0.179425	0.0018081	0.0014402	0.0009297
PORTLAND, O	1/2	90	108	107	66	85	45	84	52	52	42	42	0.515561	0.932554	1.570001	0.0153562	0.0126283	0.0088980
PORTLAND, O	3/8	85	102	104	64	80	40	78	48	51	41	41	0.494155	0.894694	1.510197	0.0147331	0.0121492	0.0086242
PORTLAND, O	1/4	89	88	96	61	59	47	69	43	49	40	39	0.467622	0.847696	1.432483	0.0139673	0.0115389	0.0082021
PORTLAND, O	3/16	36	69	64	34	58	34	47	37	45	32	28	0.364567	0.664030	1.126641	0.0109543	0.0091148	0.0065024
PORTLAND, O	1 8	36	67	61	33	56	32	43	37	46	31	26	0.352407	0.642053	1.089862	0.0105921	0.0088182	0.0062971
PORTLAND, O	1/16	20	31	30	25	29	24	33	16	29	13	15	0.198339	0.360038	0.605183	0.0059477	0.0048911	0.0033938
PORTLAND, O	0	9	12	12	13	18	13	18	16	16	5	10	0.116941	0.213199	0.358797	0.0035321	0.0029118	0.0020078

TABLE A-2. US AIRPORT VISIBILITY DATA (16 pages)(.. A-17 thru A-32)

AIRPORT: ATLANTA,GA. YEAR: 1967

VISI-BILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15-	30-	45-	60-	90-	120-	180-	240-	360-	480-	600
1/2	108	72	58	52	71	46	47	34	34	20	20
3/8	99	66	55	47	64	44	46	32	33	19	19
1/4	74	54	57	38	70	36	45	28	32	21	16
3/16	34	29	32	20	24	20	31	19	20	9	10
1/8	28	26	24	18	18	16	28	19	15	8	9
1/16	9	5	4	6	6	4	6	2	2	4	1
0	1	1	4	0	1	1	3	0	2	1	0

AVERAGE ARRIVAL RATE = 31.1, MAXIMUM IFR LANDING RATE = 72.0
COEFFICIENT OF DELAY PROPAGATION = 1.43, DELAY MULTIPLIER = 1.76

VISI-BILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.324058	0.606949	1.076097	0.0096294	0.0080394	0.0057173
3/8	0.307755	0.576995	1.024477	0.0091620	0.0076672	0.0054851
1/4	0.290941	0.546132	0.970516	0.0086825	0.0072491	0.0051467
3/16	0.165203	0.311214	0.555858	0.0049612	0.0041866	0.0030947
1/8	0.142403	0.268533	0.480768	0.0042850	0.0036394	0.0027088
1/16	0.030125	0.056597	0.100571	0.0009015	0.0007574	0.0005401
0	0.009809	0.018496	0.032865	0.0002944	0.0002419	0.0001839

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.34	+	0.80	=	1.14	=	685.93
3/8 - 1/4	0.19	+	1.16	=	1.36	=	814.69
1/4 - 3/16	2.44	+	7.06	=	9.50	=	5700.53
3/16 - 1/8	0.42	+	1.33	=	1.74	=	1046.88
1/8 - 1/16	1.74	+	7.46	=	9.20	=	5519.92
1/16 - 0	0.36	+	1.23	=	1.59	=	952.35
0 -	0.16	+	0.63	=	0.79	=	473.49
TOTAL	5.66	+	19.67	=	25.32	=	15193.69

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.08	+	0.26	+	0.30	=	0.64	=	1537.00
3/8 - 1/4	0.06	+	0.27	+	0.44	=	0.77	=	1856.68
1/4 - 3/16	0.52	+	2.11	+	2.67	=	5.30	=	12725.24
3/16 - 1/8	0.10	+	0.37	+	0.50	=	0.98	=	2340.20
1/8 - 1/16	0.40	+	1.93	+	2.82	=	5.15	=	12358.59
1/16 - 0	0.07	+	0.35	+	0.46	=	0.89	=	2134.25
0 -	0.04	+	0.16	+	0.24	=	0.44	=	1059.38
TOTAL	1.27	+	5.47	+	7.43	=	14.17	=	34011.34

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.02	+	0.43	=	0.46	=	1381.38
3/8 - 1/4	0.01	+	0.01	+	0.48	=	0.51	=	1515.99
1/4 - 3/16	0.06	+	0.16	+	3.52	=	3.74	=	11219.12
3/16 - 1/8	0.01	+	0.03	+	0.63	=	0.67	=	2013.91
1/8 - 1/16	0.04	+	0.12	+	3.31	=	3.48	=	10441.16
1/16 - 0	0.01	+	0.02	+	0.59	=	0.62	=	1870.04
0 -	0.00	+	0.01	+	0.28	=	0.30	=	885.52
TOTAL	0.14	+	0.39	+	9.25	=	9.78	=	29327.11

AIRPORT: ATLANTA,GA. YEAR: 1970

VISIBILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15	30	45	60	90	120	180	240	360	480	600
1/2	108	72	58	52	71	46	47	34	34	20	20
3/8	99	66	55	47	64	44	46	32	33	19	19
1/4	74	54	57	38	70	36	45	28	32	21	16
3/16	34	29	32	20	24	20	31	19	20	9	10
1/8	28	26	24	18	18	16	28	19	15	8	9
1/16	9	5	4	6	6	4	6	2	2	4	1
0	1	1	4	0	1	1	3	0	2	1	0

AVERAGE ARRIVAL RATE = 43.5, MAXIMUM IFR LANDING RATE = 72.0
COEFFICIENT OF DELAY PROPAGATION = 1.60, DELAY MULTIPLIER = 2.53

VISIBILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.336081	0.652013	1.227924	0.0097928	0.0082670	0.0059397
3/8	0.318983	0.619328	1.166105	0.0093156	0.0078802	0.0057059
1/4	0.301250	0.586640	1.109222	0.0088292	0.0074449	0.0053314
3/16	0.170734	0.333170	0.624448	0.0050404	0.0042901	0.0032401
1/8	0.147098	0.285685	0.537934	0.0043513	0.0037309	0.0028405
1/16	0.031164	0.060522	0.114344	0.0009165	0.0007805	0.0005623
0	0.010130	0.020090	0.036738	0.0002996	0.0002453	0.0001942

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY	+	DIVERSION	=	TOTAL	=	TOTAL PER YEAR
1/2 - 3/8	0.49	+	0.80	=	1.29	=	776.41
3/8 - 1/4	0.17	+	1.29	=	1.46	=	876.75
1/4 - 3/16	3.39	+	7.19	=	10.58	=	6350.67
3/16 - 1/8	0.56	+	1.37	=	1.93	=	1160.23
1/8 - 1/16	2.18	+	7.84	=	10.02	=	6009.00
1/16 - 0	0.48	+	1.27	=	1.75	=	1050.69
0 -	0.19	+	0.67	=	0.86	=	517.66
TOTAL	7.47	+	20.43	=	27.90	=	16741.40

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY	+	DIVERSION	+	CANCEL	=	TOTAL	=	TOTAL PER YEAR
1/2 - 3/8	0.10	+	0.27	+	0.30	=	0.67	=	1616.47
3/8 - 1/4	0.07	+	0.28	+	0.49	=	0.83	=	2002.78
1/4 - 3/16	0.65	+	2.18	+	2.72	=	5.56	=	13332.20
3/16 - 1/8	0.13	+	0.38	+	0.52	=	1.03	=	2475.03
1/8 - 1/16	0.50	+	1.96	+	2.96	=	5.43	=	13025.20
1/16 - 0	0.08	+	0.37	+	0.48	=	0.93	=	2233.01
0 -	0.05	+	0.16	+	0.25	=	0.47	=	1126.55
TOTAL	1.59	+	5.61	+	7.72	=	14.92	=	35811.23

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY	+	HOLD	+	CANCEL	=	TOTAL	=	TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.03	+	0.44	=	0.48	=	1454.23
3/8 - 1/4	0.01	+	0.01	+	0.50	=	0.53	=	1584.45
1/4 - 3/16	0.07	+	0.20	+	3.63	=	3.90	=	11696.91
3/16 - 1/8	0.01	+	0.04	+	0.64	=	0.70	=	2093.19
1/8 - 1/16	0.05	+	0.15	+	3.39	=	3.60	=	10801.09
1/16 - 0	0.01	+	0.02	+	0.62	=	0.65	=	1951.68
0 -	0.00	+	0.02	+	0.28	=	0.30	=	914.47
TOTAL	0.17	+	0.48	+	9.51	=	10.17	=	30496.03

AIRPORT: BALTIMORE YEAR: 1967

VISI-BILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15-	30-	45-	60-	90-	120-	180-	240-	360-	480-	600
1/2	65	80	62	35	52	42	71	36	31	26	39
3/8	60	70	57	32	49	40	67	33	30	25	37
1/4	44	47	46	26	46	40	53	26	28	23	33
3/16	18	25	27	21	29	36	30	10	27	18	24
1/8	18	27	23	18	24	26	30	12	27	12	22
1/16	3	9	8	11	10	14	10	10	15	7	10
0	1	3	7	11	4	9	5	3	4	3	3

AVERAGE ARRIVAL RATE = 17.8, MAXIMUM IFR LANDING RATE = 41.5
COEFFICIENT OF DELAY PROPAGATION = 1.43, DELAY MULTIPLIER = 1.75

VISI-BILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.399483	0.756123	1.367599	0.0121082	0.0104641	0.0080273
3/8	0.377979	0.716144	1.296797	0.0114797	0.0099371	0.0076309
1/4	0.331844	0.630312	1.144258	0.0101311	0.0087967	0.0067430
3/16	0.238870	0.455318	0.830303	0.0073439	0.0064265	0.0049826
1/8	0.212320	0.404580	0.738354	0.0065217	0.0057207	0.0044539
1/16	0.107807	0.206142	0.377623	0.0033351	0.0029466	0.0023108
0	0.041019	0.077348	0.137144	0.0012388	0.0010351	0.0007704

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.34	+	1.36	=	1.70	=	1020.25
3/8 - 1/4	0.67	+	3.05	=	3.72	=	2232.72
1/4 - 3/16	1.49	+	6.06	=	7.55	=	4527.09
3/16 - 1/8	0.41	+	1.82	=	2.23	=	1339.19
1/8 - 1/16	1.50	+	7.37	=	8.87	=	5324.36
1/16 - 0	0.81	+	5.30	=	6.11	=	3663.33
0 -	0.65	+	2.65	=	3.30	=	1978.98
TOTAL	5.86	+	27.61	=	33.48	=	20085.90

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.09	+	0.35	+	0.52	=	0.95	=	2389.26
3/8 - 1/4	0.18	+	0.76	+	1.15	=	2.09	=	5014.38
1/4 - 3/16	0.33	+	1.59	+	2.29	=	4.22	=	10121.90
3/16 - 1/8	0.09	+	0.47	+	0.69	=	1.25	=	2991.81
1/8 - 1/16	0.33	+	1.85	+	2.79	=	4.96	=	11901.70
1/16 - 0	0.14	+	1.26	+	2.00	=	3.40	=	8169.00
0 -	0.16	+	0.70	+	1.00	=	1.85	=	4447.09
TOTAL	1.31	+	6.98	+	10.44	=	18.72	=	44935.13

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.02	+	0.61	=	0.64	=	1924.66
3/8 - 1/4	0.02	+	0.05	+	1.31	=	1.39	=	4156.13
1/4 - 3/16	0.04	+	0.10	+	2.73	=	2.87	=	8596.03
3/16 - 1/8	0.01	+	0.03	+	0.81	=	0.85	=	2542.43
1/8 - 1/16	0.04	+	0.10	+	3.19	=	3.33	=	9979.33
1/16 - 0	0.02	+	0.04	+	2.20	=	2.26	=	6774.91
0 -	0.02	+	0.05	+	1.19	=	1.26	=	3766.12
TOTAL	0.15	+	0.40	+	12.03	=	12.58	=	37739.61

AIRPORT: BALTIMORE YEAR: 1970

VISIBILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES 0-15	15-30	30-45	45-60	60-90	90-120	120-180	180-240	240-360	360-480	480-600
1/2	65	80	62	35	52	42	71	36	31	26	39
3/8	60	70	57	32	49	40	67	33	30	25	37
1/4	44	47	46	26	46	40	53	26	28	23	33
3/16	18	25	27	21	29	36	30	10	27	18	24
1/8	18	27	23	18	24	26	30	12	27	12	22
1/16	3	9	8	11	10	14	10	10	15	7	10
0	1	3	7	11	4	9	5	3	4	3	3

AVERAGE ARRIVAL RATE = 22.3, MAXIMUM IFR LANDING RATE = 41.6
COEFFICIENT OF DELAY PROPAGATION = 1.54, DELAY MULTIPLIER = 2.16

VISIBILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF 30.00	60.00	120.00	PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF 30.00	60.00	120.00
1/2	0.406415	0.781872	1.449979	0.0122191	0.0106160	0.0082444
3/8	0.384386	0.740160	1.374373	0.0115838	0.0100812	0.0078368
1/4	0.337115	0.650685	1.212715	0.0102214	0.0089256	0.0069197
3/16	0.242341	0.468989	0.877340	0.0074063	0.0065210	0.0051131
1/8	0.215459	0.416602	0.779422	0.0065763	0.0058040	0.0045721
1/16	0.109249	0.211768	0.397565	0.0033619	0.0029910	0.0023739
0	0.041730	0.080362	0.146148	0.0012526	0.0010548	0.0007963

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.39	+	1.40	=	1.79	=	1073.51
3/8 - 1/4	0.75	+	3.15	=	3.90	=	2341.91
1/4 - 3/16	1.72	+	6.21	=	7.93	=	4760.50
3/16 - 1/8	0.48	+	1.86	=	2.34	=	1403.75
1/8 - 1/16	1.71	+	7.56	=	9.27	=	5564.39
1/16 - 0	0.90	+	5.43	=	6.33	=	3796.37
0 -	0.73	+	2.74	=	3.47	=	2083.71
TOTAL	6.68	+	28.36	=	35.04	=	21024.13

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.10	+	0.36	+	0.53	=	0.99	=	2364.90
3/8 - 1/4	0.21	+	0.76	+	1.19	=	2.16	=	5186.86
1/4 - 3/16	0.38	+	1.61	+	2.35	=	4.34	=	10423.23
3/16 - 1/8	0.10	+	0.48	+	0.70	=	1.28	=	3070.14
1/8 - 1/16	0.37	+	1.87	+	2.86	=	5.09	=	12221.08
1/16 - 0	0.16	+	1.27	+	2.05	=	3.48	=	8341.76
0 -	0.17	+	0.71	+	1.04	=	1.92	=	4598.13
TOTAL	1.48	+	7.06	+	10.72	=	19.25	=	46206.10

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.03	+	0.62	=	0.66	=	1967.31
3/8 - 1/4	0.03	+	0.06	+	1.33	=	1.41	=	4242.08
1/4 - 3/16	0.04	+	0.12	+	2.77	=	2.92	=	8771.31
3/16 - 1/8	0.01	+	0.03	+	0.82	=	0.86	=	2593.09
1/8 - 1/16	0.04	+	0.11	+	3.23	=	3.39	=	10162.89
1/16 - 0	0.02	+	0.05	+	2.23	=	2.29	=	6873.73
0 -	0.02	+	0.06	+	1.21	=	1.29	=	3856.39
TOTAL	0.16	+	0.45	+	12.21	=	12.82	=	38466.79

AIRPORT: CHICAGO, OHARE YEAR: 1967

VISI-BILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES 0-15	15-30	30-45	45-60	60-90	90-120	120-180	180-240	240-360	360-480	480-600
1/2	62	55	38	29	32	33	40	26	25	8	11
3/8	59	51	36	26	30	30	40	24	24	7	11
1/4	41	42	25	19	25	34	37	19	22	7	10
3/16	20	15	13	17	18	20	29	7	11	5	9
1/8	19	11	10	17	19	17	24	7	10	7	7
1/16	10	7	4	9	12	10	8	8	5	4	4
0	3	3	4	4	7	5	8	4	5	2	2

AVERAGE ARRIVAL RATE = 55.1, MAXIMUM IFR LANDING RATE = 108.0
COEFFICIENT OF DELAY PROPAGATION = 1.51, DELAY MULTIPLIER = 2.04

VISI-BILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF 30.00	60.00	120.00	PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF 30.00	60.00	120.00
1/2	0.208651	0.395467	0.714524	0.0061345	0.0051444	0.0037160
3/8	0.198258	0.376029	0.680192	0.0058380	0.0049048	0.0035549
1/4	0.179029	0.340270	0.619146	0.0053097	0.0045117	0.0032629
3/16	0.116223	0.221970	0.405579	0.0034884	0.0029751	0.0021454
1/8	0.106854	0.204286	0.374361	0.0032176	0.0027519	0.0019714
1/16	0.060006	0.114727	0.211321	0.0018102	0.0015605	0.0011150
0	0.038007	0.072889	0.134186	0.0011513	0.0009885	0.0007111

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.22	+	0.55	=	0.77	=	463.09
3/8 - 1/4	0.38	+	1.00	=	1.38	=	828.99
1/4 - 3/16	1.15	+	3.84	=	5.00	=	2997.79
3/16 - 1/8	0.15	+	0.60	=	0.75	=	449.12
1/8 - 1/16	0.87	+	2.95	=	3.82	=	2291.91
1/16 - 0	0.42	+	1.39	=	1.81	=	1083.05
0 -	0.71	+	2.45	=	3.15	=	1892.77
TOTAL	3.89	+	12.78	=	16.68	=	10006.70

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.05	+	0.17	+	0.21	=	0.43	=	1023.10
3/8 - 1/4	0.12	+	0.26	+	0.38	=	0.77	=	1843.79
1/4 - 3/16	0.27	+	1.04	+	1.45	=	2.76	=	6619.72
3/16 - 1/8	0.04	+	0.15	+	0.23	=	0.42	=	1003.77
1/8 - 1/16	0.18	+	0.81	+	1.11	=	2.11	=	5053.97
1/16 - 0	0.08	+	0.39	+	0.53	=	0.99	=	2379.58
0 -	0.14	+	0.67	+	0.92	=	1.73	=	4160.12
TOTAL	0.89	+	3.49	+	4.83	=	9.20	=	22084.05

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.02	+	0.28	=	0.30	=	890.97
3/8 - 1/4	0.01	+	0.04	+	0.45	=	0.50	=	1510.72
1/4 - 3/16	0.03	+	0.08	+	1.77	=	1.88	=	5632.96
3/16 - 1/8	0.01	+	0.01	+	0.26	=	0.27	=	824.55
1/8 - 1/16	0.02	+	0.06	+	1.37	=	1.45	=	4340.63
1/16 - 0	0.01	+	0.02	+	0.66	=	0.69	=	2069.19
0 -	0.01	+	0.04	+	1.14	=	1.19	=	3583.24
TOTAL	0.10	+	0.27	+	5.92	=	6.28	=	18852.25

AIRPORT: CHICAGO, OHARE YEAR: 1970

VISIBILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15	30	45	60	90	120	180	240	360	480	600
1/2	62	55	38	29	32	33	40	26	25	8	11
3/8	59	51	36	26	30	30	40	24	24	7	11
1/4	41	42	25	19	25	34	37	19	22	7	10
3/16	20	15	13	17	18	20	29	7	11	5	9
1/8	19	11	10	17	19	17	24	7	10	7	7
1/16	10	7	4	9	12	10	8	8	5	4	4
0	3	3	4	4	7	5	8	4	5	2	2

AVERAGE ARRIVAL RATE = 70.2, MAXIMUM IFR LANDING RATE = 108.0
COEFFICIENT OF DELAY PROPAGATION = 1.65, DELAY MULTIPLIER = 2.86

VISIBILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.216598	0.424967	0.807980	0.0062120	0.0052506	0.0038581
3/8	0.205716	0.403820	0.768282	0.0059110	0.0050046	0.0036906
1/4	0.185370	0.363445	0.697101	0.0053730	0.0046065	0.0033960
3/16	0.119840	0.236122	0.456897	0.0035296	0.0030410	0.0022261
1/8	0.110059	0.216878	0.422798	0.0032554	0.0028146	0.0020392
1/16	0.061783	0.121409	0.238921	0.0018307	0.0015963	0.0011496
0	0.039073	0.077285	0.151331	0.0011644	0.0010096	0.0007355

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.28	+	0.58	=	0.86	=	516.29
3/8 - 1/4	0.52	+	1.01	=	1.53	=	919.78
1/4 - 3/16	1.45	+	4.02	=	5.47	=	3283.07
3/16 - 1/8	0.17	+	0.64	=	0.81	=	487.24
1/8 - 1/16	1.12	+	3.06	=	4.18	=	2507.15
1/16 - 0	0.55	+	1.42	=	1.97	=	1184.45
0 -	0.91	+	2.53	=	3.44	=	2066.74
TOTAL	5.00	+	13.27	=	18.27	=	10964.71

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.07	+	0.17	+	0.22	=	0.45	=	1084.93
3/8 - 1/4	0.17	+	0.27	+	0.38	=	0.82	=	1966.21
1/4 - 3/16	0.34	+	1.05	+	1.52	=	2.91	=	6990.96
3/16 - 1/8	0.06	+	0.15	+	0.24	=	0.45	=	1076.45
1/8 - 1/16	0.23	+	0.82	+	1.16	=	2.21	=	5298.89
1/16 - 0	0.09	+	0.40	+	0.54	=	1.03	=	2470.01
0 -	0.17	+	0.68	+	0.96	=	1.81	=	4341.82
TOTAL	1.12	+	3.54	+	5.02	=	9.68	=	23229.27

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.02	+	0.28	=	0.31	=	929.29
3/8 - 1/4	0.02	+	0.05	+	0.46	=	0.53	=	1581.55
1/4 - 3/16	0.04	+	0.10	+	1.80	=	1.94	=	5821.81
3/16 - 1/8	0.01	+	0.02	+	0.26	=	0.28	=	852.42
1/8 - 1/16	0.02	+	0.07	+	1.40	=	1.50	=	4485.89
1/16 - 0	0.01	+	0.03	+	0.67	=	0.71	=	2136.95
0 -	0.02	+	0.05	+	1.16	=	1.23	=	3694.31
TOTAL	0.12	+	0.34	+	6.04	=	6.50	=	19502.21

AIRPORT: CLEVELAND YEAR: 1967

VISI-BILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15	30	45	60	90	120	180	240	360	480	600
1/2	160	65	42	19	36	21	28	22	24	11	7
3/8	150	60	37	17	32	18	26	21	22	10	6
1/4	91	45	27	17	23	16	20	21	18	10	6
3/16	28	21	16	11	14	6	14	17	13	7	3
1/8	26	17	17	10	13	5	15	16	12	6	3
1/16	7	11	4	4	11	1	18	7	3	1	3
0	4	9	3	5	1	1	3	3	1	1	0

AVERAGE ARRIVAL RATE = 27.3, MAXIMUM IFR LANDING RATE = 56.8
COEFFICIENT OF DELAY PROPAGATION = 1.48, DELAY MULTIPLIER = 1.93

VISI-BILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.181120	0.339187	0.606228	0.0052556	0.0043752	0.0031570
3/8	0.164419	0.307860	0.550554	0.0047704	0.0039794	0.0028758
1/4	0.144510	0.272165	0.490093	0.0042510	0.0035964	0.0026625
3/16	0.095045	0.180299	0.326879	0.0028407	0.0024244	0.0018180
1/8	0.089254	0.169470	0.306773	0.0026708	0.0022681	0.0017005
1/16	0.046902	0.088660	0.160788	0.0013968	0.0011896	0.0008132
0	0.013580	0.024944	0.043028	0.0003784	0.0003040	0.0002190

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.32	+	0.97	=	1.29	=	771.14
3/8 - 1/4	0.51	+	0.73	=	1.24	=	743.57
1/4 - 3/16	0.90	+	2.91	=	3.80	=	2281.40
3/16 - 1/8	0.09	+	0.40	=	0.49	=	294.75
1/8 - 1/16	0.57	+	3.05	=	3.63	=	2175.14
1/16 - 0	0.67	+	2.04	=	2.72	=	1630.61
0 -	0.24	+	0.75	=	1.00	=	597.68
TOTAL	3.30	+	10.86	=	14.16	=	8494.29

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.08	+	0.27	+	0.37	=	0.71	=	1709.00
3/8 - 1/4	0.13	+	0.27	+	0.28	=	0.68	=	1635.39
1/4 - 3/16	0.22	+	0.79	+	1.10	=	2.11	=	5069.33
3/16 - 1/8	0.01	+	0.10	+	0.15	=	0.27	=	653.60
1/8 - 1/16	0.16	+	0.71	+	1.15	=	2.02	=	4854.98
1/16 - 0	0.11	+	0.61	+	0.77	=	1.49	=	3578.80
0 -	0.07	+	0.21	+	0.28	=	0.56	=	1341.91
TOTAL	0.78	+	2.97	+	4.10	=	7.85	=	18843.00

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.02	+	0.46	=	0.49	=	1462.02
3/8 - 1/4	0.02	+	0.04	+	0.44	=	0.49	=	1482.68
1/4 - 3/16	0.03	+	0.06	+	1.35	=	1.44	=	4317.17
3/16 - 1/8	0.00	+	0.00	+	0.18	=	0.19	=	557.48
1/8 - 1/16	0.02	+	0.05	+	1.24	=	1.31	=	3926.11
1/16 - 0	0.01	+	0.03	+	1.02	=	1.06	=	3190.53
0 -	0.01	+	0.02	+	0.35	=	0.38	=	1133.90
TOTAL	0.10	+	0.23	+	5.03	=	5.36	=	16069.88

AIRPORT: CLEVELAND YEAR: 1970

VISIBILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15-	30-	45-	60-	90-	120-	180-	240-	360-	480-	600
1/2	160	65	42	19	36	21	28	22	24	11	7
3/8	150	60	37	17	32	18	26	21	22	10	6
1/4	91	45	27	17	23	16	20	21	18	10	6
3/16	28	21	16	11	14	6	14	17	13	7	3
1/8	26	17	17	10	13	5	15	16	12	6	3
1/16	7	11	4	4	11	1	18	7	3	1	3
0	4	9	3	5	1	1	3	3	1	1	0

AVERAGE ARRIVAL RATE = 36.5, MAXIMUM IFR LANDING RATE = 56.8
COEFFICIENT OF DELAY PROPAGATION = 1.64, DELAY MULTIPLIER = 2.80

VISIBILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.189841	0.369362	0.698099	0.0053354	0.0044709	0.0032740
3/8	0.172359	0.335000	0.633354	0.0048422	0.0040667	0.0029837
1/4	0.150771	0.293941	0.557528	0.0043110	0.0036754	0.0027659
3/16	0.098581	0.193581	0.369470	0.0028791	0.0024768	0.0018879
1/8	0.092513	0.182311	0.346932	0.0027076	0.0023160	0.0017674
1/16	0.048695	0.094894	0.186238	0.0014165	0.0012231	0.0008466
0	0.014426	0.027547	0.049459	0.0003852	0.0003131	0.0002311

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.43	+	1.00	=	1.43	=	859.35
3/8 - 1/4	0.72	+	0.75	=	1.47	=	881.90
1/4 - 3/16	1.20	+	3.02	=	4.22	=	2531.63
3/16 - 1/8	0.12	+	0.41	=	0.53	=	319.01
1/8 - 1/16	0.73	+	3.17	=	3.90	=	2337.20
1/16 - 0	0.91	+	2.12	=	3.03	=	1817.78
0 -	0.32	+	0.80	=	1.11	=	666.03
TOTAL	4.43	+	11.26	=	15.69	=	9412.90

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.10	+	0.27	+	0.38	=	0.75	=	1811.33
3/8 - 1/4	0.18	+	0.28	+	0.28	=	0.74	=	1783.07
1/4 - 3/16	0.29	+	0.81	+	1.14	=	2.24	=	5377.70
3/16 - 1/8	0.02	+	0.11	+	0.16	=	0.28	=	674.73
1/8 - 1/16	0.22	+	0.71	+	1.20	=	2.13	=	5110.25
1/16 - 0	0.13	+	0.63	+	0.80	=	1.56	=	3735.78
0 -	0.09	+	0.21	+	0.30	=	0.60	=	1441.85
TOTAL	1.03	+	3.02	+	4.26	=	8.31	=	19934.70

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.03	+	0.46	=	0.51	=	1522.02
3/8 - 1/4	0.02	+	0.05	+	0.45	=	0.52	=	1571.44
1/4 - 3/16	0.04	+	0.08	+	1.38	=	1.50	=	4493.59
3/16 - 1/8	0.00	+	0.00	+	0.18	=	0.19	=	575.15
1/8 - 1/16	0.02	+	0.07	+	1.26	=	1.35	=	4046.62
1/16 - 0	0.01	+	0.04	+	1.05	=	1.10	=	3300.70
0 -	0.01	+	0.03	+	0.36	=	0.40	=	1190.56
TOTAL	0.12	+	0.30	+	5.14	=	5.57	=	16700.07

AIRPORT: LOS ANGELES YEAR: 1967

VISIBILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES 0-15	15-30	30-45	45-60	60-90	90-120	120-180	180-240	240-360	360-480	480-600
1/2	73	84	48	47	74	52	74	31	53	35	32
3/8	69	76	46	44	69	51	71	30	52	34	31
1/4	58	56	47	35	59	48	51	25	52	33	26
3/16	33	39	44	25	52	38	36	30	45	29	22
1/8	41	36	35	21	39	40	33	26	46	22	19
1/16	25	29	19	13	46	22	19	26	36	15	11
0	13	14	7	8	20	11	18	15	21	5	3

AVERAGE ARRIVAL RATE = 41.3, MAXIMUM IFR LANDING RATE = 75.2
COEFFICIENT OF DELAY PROPAGATION = 1.55, DELAY MULTIPLIER = 2.22

VISIBILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF 30.00	60.00	120.00	PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF 30.00	60.00	120.00
1/2	0.456526	0.878994	1.643760	0.0137141	0.0119576	0.0090227
3/8	0.441174	0.850164	1.590723	0.0132799	0.0115944	0.0087817
1/4	0.391087	0.755598	1.414592	0.0118229	0.0103265	0.0079117
3/16	0.337356	0.653463	1.225831	0.0102472	0.0089605	0.0069066
1/8	0.299243	0.579267	1.086012	0.0090897	0.0079717	0.0061656
1/16	0.216525	0.418156	0.789832	0.0065588	0.0057513	0.0042590
0	0.107817	0.207757	0.390613	0.0032543	0.0028399	0.0020571

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL	TOTAL PER YEAR
1/2 - 3/8	0.35	+	0.33	=	1.18	= 707.25
3/8 - 1/4	1.04	+	2.99	=	4.03	= 2419.77
1/4 - 3/16	0.99	+	3.46	=	4.45	= 2667.37
3/16 - 1/8	0.74	+	2.55	=	3.29	= 1972.28
1/8 - 1/16	0.98	+	6.56	=	7.54	= 4521.43
1/16 - 0	1.96	+	7.57	=	9.53	= 5719.16
0 -	2.08	+	7.08	=	9.16	= 5496.60
TOTAL	8.14	+	31.04	=	39.17	= 23503.85

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL	TOTAL PER YEAR
1/2 - 3/8	0.07	+	0.25	+	0.31	= 0.64	=	1526.92
3/8 - 1/4	0.19	+	0.87	+	1.13	= 2.19	=	5254.79
1/4 - 3/16	0.21	+	0.92	+	1.31	= 2.43	=	5840.46
3/16 - 1/8	0.15	+	0.66	+	0.96	= 1.78	=	4268.65
1/8 - 1/16	0.28	+	1.43	+	2.48	= 4.20	=	10070.14
1/16 - 0	0.36	+	1.95	+	2.86	= 5.18	=	12422.41
0 -	0.38	+	1.92	+	2.67	= 4.98	=	11947.49
TOTAL	1.65	+	8.01	+	11.73	= 21.39	=	51330.36

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL	TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.02	+	0.42	= 0.45	=	1342.23
3/8 - 1/4	0.03	+	0.05	+	1.46	= 1.54	=	4608.66
1/4 - 3/16	0.03	+	0.06	+	1.57	= 1.66	=	4968.64
3/16 - 1/8	0.01	+	0.05	+	1.14	= 1.20	=	3600.34
1/8 - 1/16	0.03	+	0.09	+	2.55	= 2.67	=	8014.81
1/16 - 0	0.04	+	0.11	+	3.35	= 3.50	=	10498.11
0 -	0.04	+	0.12	+	3.27	= 3.42	=	10272.59
TOTAL	0.18	+	0.50	+	13.75	= 14.44	=	43305.38

AIRPORT: LOS ANGELES YEAR: 1970

VISI-BILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15-	30-	45-	60-	90-	120-	180-	240-	360-	480-	600
1/2	73	84	48	47	74	52	74	31	53	35	32
3/8	69	76	46	44	69	51	71	30	52	34	31
1/4	58	56	47	35	59	48	51	25	52	33	26
3/16	33	39	44	25	52	38	36	30	45	29	22
1/8	41	36	35	21	39	40	33	26	46	22	19
1/16	25	29	19	13	46	22	19	26	36	15	11
0	13	14	7	8	20	11	18	15	21	5	3

AVERAGE ARRIVAL RATE = 51.6, MAXIMUM IFR LANDING RATE = 75.2
COEFFICIENT OF DELAY PROPAGATION = 1.69, DELAY MULTIPLIER = 3.19

VISI-BILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.472316	0.937271	1.860256	0.0138475	0.0121669	0.0092655
3/8	0.456106	0.905858	1.797113	0.0134079	0.0117954	0.0090209
1/4	0.403690	0.805107	1.593030	0.0119354	0.0104952	0.0081222
3/16	0.347620	0.695880	1.378436	0.0103432	0.0090998	0.0070837
1/8	0.308377	0.615962	1.216543	0.0091738	0.0080979	0.0063414
1/16	0.223342	0.444147	0.899893	0.0066207	0.0058524	0.0043583
0	0.111321	0.220779	0.445950	0.0032866	0.0028962	0.0021205

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.49	+	0.84	=	1.33	=	798.84
3/8 - 1/4	1.40	+	3.09	=	4.49	=	2692.23
1/4 - 3/16	1.30	+	3.57	=	4.88	=	2926.28
3/16 - 1/8	1.06	+	2.55	=	3.61	=	2165.55
1/8 - 1/16	1.14	+	6.82	=	7.96	=	4777.62
1/16 - 0	2.69	+	7.70	=	10.39	=	6231.86
0 -	2.78	+	7.29	=	10.07	=	6042.70
TOTAL	10.85	+	31.87	=	42.73	=	25635.07

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.09	+	0.26	+	0.32	=	0.67	=	1604.05
3/8 - 1/4	0.23	+	0.89	+	1.17	=	2.29	=	5497.80
1/4 - 3/16	0.26	+	0.94	+	1.35	=	2.55	=	6116.22
3/16 - 1/8	0.20	+	0.67	+	0.96	=	1.84	=	4419.23
1/8 - 1/16	0.38	+	1.44	+	2.58	=	4.39	=	10541.90
1/16 - 0	0.47	+	1.98	+	2.91	=	5.36	=	12856.93
0 -	0.48	+	1.96	+	2.76	=	5.19	=	12460.03
TOTAL	2.11	+	8.13	+	12.05	=	22.29	=	53496.17

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.03	+	0.43	=	0.47	=	1396.59
3/8 - 1/4	0.03	+	0.06	+	1.50	=	1.59	=	4771.71
1/4 - 3/16	0.03	+	0.07	+	1.60	=	1.71	=	5134.90
3/16 - 1/8	0.02	+	0.07	+	1.15	=	1.24	=	3706.36
1/8 - 1/16	0.03	+	0.12	+	2.58	=	2.74	=	8214.48
1/16 - 0	0.05	+	0.14	+	3.40	=	3.59	=	10778.73
0 -	0.05	+	0.15	+	3.33	=	3.53	=	10584.36
TOTAL	0.23	+	0.64	+	13.99	=	14.86	=	44587.13

AIRPORT: MIAMI,FLA. YEAR: 1967

VISI-BILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15	15-30	30-45	45-60	60-90	90-120	120-180	180-240	240-360	360-480	480-600
1/2	40	25	19	10	12	10	13	11	10	3	0
3/8	38	24	18	10	11	9	12	10	9	3	0
1/4	35	23	17	9	13	7	13	9	9	3	0
3/16	11	12	5	3	16	7	9	6	3	2	0
1/8	13	10	5	4	15	6	9	6	3	2	0
1/16	3	6	1	5	5	4	5	2	1	0	0
0	2	3	1	0	2	2	1	0	0	0	0

AVERAGE ARRIVAL RATE = 38.3, MAXIMUM IFR LANDING RATE = 64.8
COEFFICIENT OF DELAY PROPAGATION = 1.59, DELAY MULTIPLIER = 2.45

VISI-BILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.068051	0.130421	0.236923	0.0019105	0.0015423	0.0010781
3/8	0.063052	0.120750	0.218824	0.0017651	0.0014213	0.0009955
1/4	0.061747	0.118283	0.215874	0.0017324	0.0013985	0.0009617
3/16	0.038103	0.072679	0.138669	0.0010777	0.0008810	0.0004896
1/8	0.037191	0.071115	0.135335	0.0010571	0.0008640	0.0004896
1/16	0.014803	0.027829	0.051459	0.0004052	0.0003200	0.0001591
0	0.003353	0.006141	0.011262	0.0000826	0.0000583	0.0000142

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.12	+	0.28	=	0.40	=	241.58
3/8 - 1/4	-0.02	+	0.12	=	0.10	=	60.25
1/4 - 3/16	0.30	+	1.62	=	1.92	=	1153.17
3/16 - 1/8	0.05	+	0.0	=	0.05	=	29.01
1/8 - 1/16	0.64	+	1.14	=	1.78	=	1066.84
1/16 - 0	0.33	+	0.50	=	0.83	=	497.58
0 -	0.14	+	0.05	=	0.19	=	112.44
TOTAL	1.56	+	3.71	=	5.27	=	3160.86

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.02	+	0.08	+	0.11	=	0.21	=	515.88
3/8 - 1/4	0.01	+	0.01	+	0.04	=	0.07	=	159.89
1/4 - 3/16	0.15	+	0.33	+	0.61	=	1.09	=	2614.90
3/16 - 1/8	0.01	+	0.01	+	0.0	=	0.02	=	47.96
1/8 - 1/16	0.11	+	0.38	+	0.43	=	0.92	=	2211.70
1/16 - 0	0.06	+	0.19	+	0.19	=	0.44	=	1049.33
0 -	0.03	+	0.05	+	0.02	=	0.09	=	219.57
TOTAL	0.39	+	1.05	+	1.40	=	2.84	=	6819.21

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.00	+	0.01	+	0.14	=	0.15	=	448.12
3/8 - 1/4	0.00	+	0.00	+	0.03	=	0.03	=	92.59
1/4 - 3/16	0.02	+	0.04	+	0.60	=	0.66	=	1969.25
3/16 - 1/8	0.00	+	0.00	+	0.02	=	0.02	=	65.67
1/8 - 1/16	0.01	+	0.03	+	0.63	=	0.67	=	2011.60
1/16 - 0	0.01	+	0.02	+	0.30	=	0.33	=	978.73
0 -	0.00	+	0.01	+	0.07	=	0.08	=	234.55
TOTAL	0.04	+	0.12	+	1.77	=	1.93	=	5800.50

AIRPORT: MIAMI,FLA. YEAR: 1970

VISI-BILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15	30	45	60	90	120	180	240	360	480	600
1/2	40	25	19	10	12	10	13	11	10	3	0
3/8	38	24	18	10	11	9	12	10	9	3	0
1/4	35	23	17	9	13	7	13	9	9	3	0
3/16	11	12	5	3	16	7	9	6	3	2	0
1/8	13	10	5	4	15	6	9	6	3	2	0
1/16	3	6	1	5	5	4	5	2	1	0	0
0	2	3	1	0	2	2	1	0	0	0	0

AVERAGE ARRIVAL RATE = 46.0, MAXIMUM IFR LANDING RATE = 64.8
COEFFICIENT OF DELAY PROPAGATION = 1.71, DELAY MULTIPLIER = 3.45

VISI-BILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.071732	0.144305	0.276409	0.0019324	0.0015672	0.0011130
3/8	0.066519	0.133779	0.255341	0.0017856	0.0014442	0.0010275
1/4	0.065099	0.130862	0.253370	0.0017523	0.0014214	0.0009896
3/16	0.040050	0.079458	0.169964	0.0010904	0.0009015	0.0005006
1/8	0.039027	0.077706	0.165264	0.0010695	0.0008839	0.0005006
1/16	0.015699	0.030678	0.063800	0.0004110	0.0003305	0.0001661
0	0.003662	0.007093	0.015047	0.0000841	0.0000603	0.0000152

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.16	+	0.29	=	0.45	=	270.46
3/8 - 1/4	-0.04	+	0.13	=	0.09	=	55.79
1/4 - 3/16	0.36	+	1.68	=	2.04	=	1224.41
3/16 - 1/8	0.07	+	0.0	=	0.07	=	40.89
1/8 - 1/16	0.89	+	1.15	=	2.04	=	1223.92
1/16 - 0	0.44	+	0.52	=	0.96	=	578.12
0 -	0.19	+	0.05	=	0.24	=	146.39
TOTAL	2.07	+	3.83	=	5.90	=	3539.96

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.03	+	0.08	+	0.11	=	0.23	=	545.59
3/8 - 1/4	0.02	+	0.01	+	0.05	=	0.08	=	181.09
1/4 - 3/16	0.21	+	0.33	+	0.64	=	1.17	=	2801.55
3/16 - 1/8	0.01	+	0.01	+	0.0	=	0.02	=	52.85
1/8 - 1/16	0.14	+	0.39	+	0.43	=	0.97	=	2318.84
1/16 - 0	0.08	+	0.19	+	0.20	=	0.46	=	1115.84
0 -	0.04	+	0.05	+	0.02	=	0.10	=	246.55
TOTAL	0.51	+	1.07	+	1.45	=	3.03	=	7262.29

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.00	+	0.01	+	0.14	=	0.15	=	464.03
3/8 - 1/4	0.00	+	0.00	+	0.03	=	0.03	=	98.14
1/4 - 3/16	0.02	+	0.06	+	0.60	=	0.68	=	2047.52
3/16 - 1/8	0.00	+	0.00	+	0.02	=	0.02	=	69.33
1/8 - 1/16	0.01	+	0.04	+	0.64	=	0.69	=	2083.20
1/16 - 0	0.01	+	0.02	+	0.31	=	0.34	=	1024.88
0 -	0.00	+	0.01	+	0.07	=	0.08	=	251.65
TOTAL	0.06	+	0.15	+	1.80	=	2.01	=	6038.74

AIRPORT: NEWARK N.J. YEAR: 1967

VISI-BILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15-	30-	45-	60-	90-	120-	180-	240-	360-	480-	600
1/2	67	90	44	27	54	27	40	23	25	11	12
3/8	61	81	39	26	49	24	36	21	23	9	11
1/4	45	51	26	25	36	19	30	22	13	6	10
3/16	19	14	23	13	18	16	19	13	7	4	9
1/8	14	11	17	13	20	13	14	14	3	3	9
1/16	5	11	7	3	13	6	7	7	2	0	9
0	1	8	5	3	7	8	4	3	2	1	6

AVERAGE ARRIVAL RATE = 22.3, MAXIMUM IFR LANDING RATE = 48.0
COEFFICIENT OF DELAY PROPAGATION = 1.46, DELAY MULTIPLIER = 1.87

VISI-BILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.222255	0.414851	0.738153	0.0064635	0.0053717	0.0037479
3/8	0.200029	0.373228	0.663606	0.0058136	0.0048269	0.0033576
1/4	0.156382	0.292704	0.520982	0.0045806	0.0038124	0.0026449
3/16	0.103487	0.195910	0.351100	0.0030983	0.0025879	0.0018848
1/8	0.089300	0.169024	0.303259	0.0026758	0.0022359	0.0015924
1/16	0.055819	0.106245	0.194751	0.0016919	0.0014709	0.0010971
0	0.040146	0.076415	0.139716	0.0012170	0.0010575	0.0007989

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.40	+	1.34	=	1.74	=	1046.62
3/8 - 1/4	0.83	+	2.45	=	3.28	=	1967.82
1/4 - 3/16	1.14	+	2.61	=	3.76	=	2253.30
3/16 - 1/8	0.18	+	1.01	=	1.19	=	714.46
1/8 - 1/16	0.71	+	1.70	=	2.42	=	1449.24
1/16 - 0	0.28	+	1.03	=	1.30	=	782.90
0 -	0.64	+	2.75	=	3.38	=	2030.45
TOTAL	4.18	+	12.89	=	17.07	=	10244.78

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.09	+	0.37	+	0.51	=	0.97	=	2324.07
3/8 - 1/4	0.20	+	0.69	+	0.93	=	1.82	=	4365.86
1/4 - 3/16	0.24	+	0.86	+	0.99	=	2.09	=	5004.12
3/16 - 1/8	0.06	+	0.23	+	0.38	=	0.67	=	1603.66
1/8 - 1/16	0.17	+	0.53	+	0.64	=	1.35	=	3235.54
1/16 - 0	0.05	+	0.28	+	0.39	=	0.72	=	1725.71
0 -	0.13	+	0.71	+	1.04	=	1.88	=	4509.78
TOTAL	0.94	+	3.67	+	4.87	=	9.49	=	22768.73

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.03	+	0.63	=	0.66	=	1993.37
3/8 - 1/4	0.03	+	0.06	+	1.17	=	1.25	=	3749.79
1/4 - 3/16	0.03	+	0.06	+	1.41	=	1.51	=	4520.95
3/16 - 1/8	0.01	+	0.02	+	0.40	=	0.43	=	1285.26
1/8 - 1/16	0.02	+	0.06	+	0.88	=	0.95	=	2857.70
1/16 - 0	0.01	+	0.02	+	0.48	=	0.50	=	1490.34
0 -	0.01	+	0.04	+	1.22	=	1.27	=	3813.69
TOTAL	0.12	+	0.28	+	6.18	=	6.57	=	19711.08

AIRPORT: NEWARK N.J. YEAR: 1970

VISI-BILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15	30	45	60	90	120	180	240	360	480	600
1/2	67	90	44	27	54	27	40	23	25	11	12
3/8	61	81	39	26	49	24	36	21	23	9	11
1/4	45	51	26	25	36	19	30	22	13	6	10
3/16	19	14	23	13	18	16	19	13	7	4	9
1/8	14	11	17	13	20	13	14	14	3	3	9
1/16	5	11	7	3	13	6	7	7	2	0	9
0	1	8	5	3	7	3	4	3	2	1	6

AVERAGE ARRIVAL RATE = 26.4, MAXIMUM IFR LANDING RATE = 48.0
COEFFICIENT OF DELAY PROPAGATION = 1.55, DELAY MULTIPLIER = 2.22

VISI-BILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.226832	0.430274	0.788782	0.0065199	0.0054469	0.0038200
3/8	0.204163	0.387139	0.709415	0.0058647	0.0048956	0.0034220
1/4	0.159409	0.303191	0.556492	0.0046207	0.0038704	0.0026999
3/16	0.105113	0.202692	0.372363	0.0031245	0.0026205	0.0019277
1/8	0.090688	0.174749	0.322788	0.0026986	0.0022678	0.0016233
1/16	0.056615	0.109170	0.205847	0.0017035	0.0014881	0.0011125
0	0.040716	0.078521	0.147205	0.0012254	0.0010699	0.0008135

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.46	+	1.37	=	1.83	=	1096.43
3/8 - 1/4	0.96	+	2.48	=	3.45	=	2067.05
1/4 - 3/16	1.33	+	2.66	=	3.98	=	2389.50
3/16 - 1/8	0.19	+	1.05	=	1.24	=	741.81
1/8 - 1/16	0.81	+	1.76	=	2.56	=	1538.37
1/16 - 0	0.33	+	1.03	=	1.36	=	815.15
0 -	0.72	+	2.80	=	3.52	=	2110.49
TOTAL	4.79	+	13.14	=	17.93	=	10758.80

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.10	+	0.37	+	0.52	=	0.99	=	2384.46
3/8 - 1/4	0.23	+	0.70	+	0.94	=	1.87	=	4479.89
1/4 - 3/16	0.26	+	0.88	+	1.00	=	2.14	=	5139.85
3/16 - 1/8	0.07	+	0.23	+	0.40	=	0.69	=	1661.19
1/8 - 1/16	0.19	+	0.54	+	0.66	=	1.40	=	3351.33
1/16 - 0	0.06	+	0.28	+	0.39	=	0.73	=	1750.63
0 -	0.15	+	0.72	+	1.06	=	1.92	=	4605.65
TOTAL	1.06	+	3.72	+	4.97	=	9.74	=	23372.99

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.01	+	0.03	+	0.63	=	0.68	=	2029.38
3/8 - 1/4	0.03	+	0.06	+	1.18	=	1.27	=	3821.02
1/4 - 3/16	0.04	+	0.07	+	1.44	=	1.54	=	4634.78
3/16 - 1/8	0.01	+	0.02	+	0.41	=	0.43	=	1302.98
1/8 - 1/16	0.02	+	0.06	+	0.90	=	0.98	=	2929.30
1/16 - 0	0.01	+	0.02	+	0.48	=	0.50	=	1513.16
0 -	0.02	+	0.04	+	1.23	=	1.29	=	3873.20
TOTAL	0.13	+	0.31	+	6.26	=	6.70	=	20103.82

AIRPORT: NEW YORK,N.Y. JFK YEAR: 1967

VISI-BILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15-	30-	45-	60-	90-	120-	180-	240-	360-	480-	600
1/2	132	118	88	73	60	61	80	50	42	17	22
3/8	120	105	79	66	57	55	76	44	35	15	21
1/4	82	67	55	34	52	41	70	26	26	13	19
3/16	44	50	28	23	42	31	34	15	17	10	12
1/8	43	27	23	19	29	26	16	15	14	8	9
1/16	21	20	7	7	11	9	10	8	5	5	3
0	3	6	0	6	5	5	5	3	3	0	1

AVERAGE ARRIVAL RATE = 41.2, MAXIMUM IFR LANDING RATE = 64.0
COEFFICIENT OF DELAY PROPAGATION = 1.64, DELAY MULTIPLIER = 2.81

VISI-BILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.421997	0.826536	1.549567	0.0120085	0.0100134	0.0073671
3/8	0.381388	0.747043	1.402715	0.0108527	0.0090429	0.0066112
1/4	0.299103	0.587367	1.120308	0.0086319	0.0072882	0.0053018
3/16	0.190662	0.372380	0.719559	0.0054801	0.0046540	0.0032804
1/8	0.142958	0.280828	0.540706	0.0041511	0.0035250	0.0025378
1/16	0.063630	0.123495	0.238143	0.0018278	0.0015797	0.0011546
0	0.023445	0.045182	0.088301	0.0006700	0.0005728	0.0003696

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.81	+	2.60	=	3.41	=	2048.67
3/8 - 1/4	1.82	+	4.50	=	6.32	=	3792.51
1/4 - 3/16	2.29	+	6.95	=	9.25	=	5548.34
3/16 - 1/8	1.30	+	2.55	=	3.86	=	2313.50
1/8 - 1/16	1.98	+	4.76	=	6.74	=	4043.12
1/16 - 0	0.81	+	2.70	=	3.51	=	2104.35
0 -	0.64	+	1.27	=	1.91	=	1145.21
TOTAL	9.65	+	25.34	=	34.99	=	20995.69

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.22	+	0.64	+	0.98	=	1.84	=	4426.02
3/8 - 1/4	0.55	+	1.18	+	1.70	=	3.44	=	8246.36
1/4 - 3/16	0.58	+	1.76	+	2.63	=	4.97	=	11916.72
3/16 - 1/8	0.24	+	0.78	+	0.97	=	1.99	=	4777.02
1/8 - 1/16	0.41	+	1.32	+	1.80	=	3.54	=	8485.43
1/16 - 0	0.18	+	0.67	+	1.02	=	1.87	=	4492.00
0 -	0.11	+	0.40	+	0.48	=	0.99	=	2374.32
TOTAL	2.30	+	6.75	+	9.58	=	18.63	=	44717.86

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.02	+	0.07	+	1.12	=	1.21	=	3616.59
3/8 - 1/4	0.06	+	0.16	+	2.02	=	2.25	=	6739.88
1/4 - 3/16	0.06	+	0.18	+	3.03	=	3.27	=	9807.39
3/16 - 1/8	0.03	+	0.07	+	1.30	=	1.40	=	4195.23
1/8 - 1/16	0.04	+	0.13	+	2.24	=	2.41	=	7224.99
1/16 - 0	0.02	+	0.05	+	1.16	=	1.23	=	3699.31
0 -	0.01	+	0.03	+	0.66	=	0.70	=	2112.88
TOTAL	0.25	+	0.70	+	11.52	=	12.47	=	37396.27

AIRPORT: NEW YORK,N.Y. JFK YEAR: 1970

VISI-BILITY	NUMBER OF OCCURANCES IN TEN YEARS FOR THESE DELAY TIMES IN MINUTES										
	0-15	30	45	60	90	120	180	240	360	480	600
1/2	132	118	88	73	60	61	80	50	42	17	22
3/8	120	105	79	66	57	55	76	44	35	15	21
1/4	82	67	55	34	52	41	70	26	26	13	19
3/16	44	50	28	23	42	31	34	15	17	10	12
1/8	43	27	23	19	29	26	16	15	14	8	9
1/16	21	20	7	7	11	9	10	8	5	5	3
0	3	6	0	6	5	5	5	3	3	0	1

AVERAGE ARRIVAL RATE = 49.6, MAXIMUM IFR LANDING RATE = 64.0
COEFFICIENT OF DELAY PROPAGATION = 1.77, DELAY MULTIPLIER = 4.44

VISI-BILITY	MEAN DELAY PER LANDING - FOR MAXIMUM TOTAL DELAY OF			PROBABILITY OF DIVERSION AFTER TOTAL DELAY OF		
	30.00	60.00	120.00	30.00	60.00	120.00
1/2	0.451926	0.942559	1.895904	0.0121350	0.0101761	0.0075847
3/8	0.408411	0.851997	1.720846	0.0109677	0.0091917	0.0068052
1/4	0.318374	0.663750	1.374446	0.0087181	0.0074042	0.0054486
3/16	0.203363	0.419008	0.894462	0.0055345	0.0047341	0.0033594
1/8	0.151743	0.315688	0.666818	0.0041919	0.0035830	0.0025983
1/16	0.067957	0.137726	0.290507	0.0018445	0.0016058	0.0011844
0	0.025050	0.050105	0.111568	0.0006772	0.0005872	0.0003819

ROUTE STRUCTURE 1: LONG RANGE, 600 LANDINGS/YEAR
COST OF DELAY = $14.50/MINUTE, DIVERSION = $1700.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		TOTAL		TOTAL PER YEAR
1/2 - 3/8	1.18	+	2.68	=	3.86	=	2318.13
3/8 - 1/4	2.66	+	4.67	=	7.33	=	4397.41
1/4 - 3/16	3.32	+	7.19	=	10.51	=	6306.78
3/16 - 1/8	1.98	+	2.62	=	4.59	=	2756.83
1/8 - 1/16	3.00	+	4.86	=	7.86	=	4716.13
1/16 - 0	1.20	+	2.76	=	3.96	=	2375.29
0 -	0.95	+	1.31	=	2.27	=	1360.20
TOTAL	14.29	+	26.09	=	40.38	=	24230.76

ROUTE STRUCTURE 2: MEDIUM RANGE, 2400 LANDINGS/YEAR
COST OF DELAY = $10.20/MINUTE, DIVERSION = $1460., CANCELATION = $1300.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		DIVERSION		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.32	+	0.65	+	1.01	=	1.99	=	4765.13
3/8 - 1/4	0.83	+	1.20	+	1.76	=	3.79	=	9084.93
1/4 - 3/16	0.86	+	1.77	+	2.72	=	5.35	=	12838.45
3/16 - 1/8	0.35	+	0.80	+	0.99	=	2.14	=	5124.77
1/8 - 1/16	0.61	+	1.34	+	1.84	=	3.79	=	9087.05
1/16 - 0	0.27	+	0.67	+	1.04	=	1.99	=	4771.11
0 -	0.15	+	0.41	+	0.50	=	1.06	=	2534.44
TOTAL	3.39	+	6.84	+	9.86	=	20.09	=	48205.87

ROUTE STRUCTURE 3: SHORT RANGE, 3000 LANDINGS/YEAR
COST OF DELAY = $ 4.10/MIN, HOLD TAKE OFF = $ 0.41/MIN, CANCEL = $1150.

VISIBILITY RANGE	PER FLIGHT COSTS DELAY		HOLD		CANCEL		TOTAL		TOTAL PER YEAR
1/2 - 3/8	0.03	+	0.10	+	1.13	=	1.26	=	3790.23
3/8 - 1/4	0.09	+	0.25	+	2.06	=	2.39	=	7180.23
1/4 - 3/16	0.08	+	0.27	+	3.07	=	3.42	=	10270.65
3/16 - 1/8	0.05	+	0.10	+	1.32	=	1.47	=	4399.50
1/8 - 1/16	0.05	+	0.19	+	2.27	=	2.52	=	7564.72
1/16 - 0	0.03	+	0.08	+	1.17	=	1.28	=	3845.72
0 -	0.02	+	0.04	+	0.68	=	0.74	=	2212.14
TOTAL	0.36	+	1.02	+	11.70	=	13.09	=	39263.19

Appendix B

NEW TECHNOLOGY

After a diligent review of the work performed under this contract, no new innovation, discovery, improvement or invention was made.